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A Social Identity Threat Approach to Understanding and Combating First-Generation College Students' Academic Disadvantage

Bradley Matthew Weisz, Ph.D.
University of Connecticut, 2017

The current research investigated the extent to which *social identity threat*—the fear of confirming negative group stereotypes—could be contributing to the underachievement of first-generation-college (FGC) students, and whether brief social-psychological interventions could protect FGC students' academic achievement. Results from Studies 1 and 2 indicated that FGC students who were also members of underrepresented racial minority groups (FGC-URM students) indicated being particularly concerned about confirming negative stereotypes based on their social class and race, which has been found to interfere with students' academic achievement—this concern about confirming group stereotypes was less pronounced for FGC students from racial majority groups (FGC-majority students). Results from Study 2 indicated that two brief social-psychological interventions improved FGC-URM students' academic achievement; however, counter to expectations, one of these brief interventions harmed the achievement of FGC-majority students. These findings highlight the importance of considering FGC students' multiple, intersecting social identities when developing strategies for improving their academic outcomes, but also, the importance of ensuring that brief interventions do not inadvertently harm the students' achievement. Together, these findings suggest that social identity threat should be considered a contributing factor to the underachievement of FGC students, and that brief social-psychological interventions may have the capacity to improve FGC students' academic outcomes.

A Social Identity Threat Approach to Understanding and Combating First-Generation College
Students' Academic Disadvantage

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B.A., San Diego State University, 2011

M.A., San Diego State University, 2013

A Dissertation

Submitted in Partial Fulfillment of the

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Doctor of Philosophy

at the

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2017

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Bradley Matthew Weisz

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APPROVAL PAGE

Doctor of Philosophy Dissertation

A Social Identity Threat Approach to Understanding and Combating First-Generation College
Students' Academic Disadvantage

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2017

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Chapter 1

First-Generation-College Students' Disadvantage

America is often touted as the land of opportunity—where people can pull themselves up by their bootstraps and climb the socio-economic ladder as long as they put in the effort (e.g., Alger, 1868/2014; Kraus & Tan, 2015; cf. Weiss, 1969/1988). Despite these promises of social mobility, in America, social class is typically passed down from generation to generation (see Corcoran, 1995). For those at the lower end of the socio-economic ladder, gaining admission to college and earning a degree represents a means for breaking this intergenerational cycle of social class. In addition to the fact that people with college degrees tend to have better economic opportunities than those without a college degree (U.S. Department of Labor, 2016; of see also Autor, 2014), by definition, earning a college a degree increases someone's socio-economic status (SES; Hollingshead, 1975). Simply getting admitted to a four-year university is likely perceived as an achievement for first-generation-college (FGC) students (i.e., college students whose parents have not earned college degrees); however, once in college, FGC students tend to struggle—earning lower grades and dropping out at higher rates—compared to continuing-generation-college (CGC) students (i.e., college students who have at least one parent with a college degree). Although higher education is a key stepping stone in achieving social mobility for many people (Bowen, Kurzweil, & Tobin, 2005), the systematic underachievement of FGC students in American universities may derail the possibility of this mobility. Thus, it is important to understand the factors that contribute to the underachievement of FGC students.

Specifically, FGC students are significantly more likely to drop out of college before graduation than CGC students (e.g., Ishitani, 2006; Soria & Stebleton, 2012). In addition to having higher dropout rates, compared to CGC students, FGC students tend to receive lower

grades and take longer to graduate (e.g., Pascarella, Pierson, Wolniak, & Terenzini, 2004).

Common explanations for the underachievement of FGC students revolve around the fact that FGC students are less academically prepared for college, less financially stable, and less likely to have people in their social networks that have been to college and can offer advice and support. Specifically, compared to CGC students, FGC students often attend lower-quality, under-resourced public high schools (Terenzini, Springer, Yaeger, Pascarella, & Nora, 1996; Warburton, Bugarin, & Nunez, 2001), and earn lower scores on college-entry standardized tests, like the SAT and the ACT (Riehl, 1994). FGC students are more likely than CGC students to need financial assistance to pay for college, and are more likely to be employed while in college (Nunez & Cuccaro-Alamin, 1998; Warburton et al., 2001). Additionally, FGC students tend to receive less support from their families while in college (Billson & Terry, 1982; York-Anderson & Bowman, 1991) and are often unable to draw upon college-educated people in their social networks for support while in college (i.e., social capital; Gofen, 2009; Moschetti & Hudley, 2008).

More recently it has been argued that the cultures that exist on most college campuses in America align better with the cultural backgrounds of CGC students compared to FGC students, which should give CGC students an academic advantage over FGC students (Stephens, Fryberg, Markus, Johnson, & Covarrubias, 2012a). However, absent from most of these explanations of FGC students' underachievement is any discussion about the fact that FGC students' are more likely than CGC students to members of social groups that are negatively stereotyped in academic contexts. Decades of research have found that students tend to underperform in contexts where they can potentially confirm a negative group stereotype (Spencer, Logel, & Davies, 2016). The current research aimed to add to our understanding of FGC students'

underachievement by examining the extent to which contending with negative group stereotypes in college interferes with FGC students' ability to perform up to their academic potential, and whether a brief social-psychological intervention—by alleviating concerns about confirming negative stereotypes—can be used to reduce or eliminate the academic achievement gap between FGC and CGC students.

Chapter 2

Social Identity Threat and First-Generation-College Students' Underachievement

On college campuses, FGC students are typically underrepresented based on both their social-class backgrounds and race/ethnicity—membership in these underrepresented groups often means contending with negative societal stereotypes about these groups. FGC students represent about 20% of students at American universities (Saenz, Hurtado, Barrera, Wolf, & Yeung, 2007). Given that educational attainment factors into definitions of SES (Hollingshead, 1975), simply being a FGC student can be considered an indicator of having lower SES. Consistent with the conceptualization of SES, FGC students are more likely to come from poor or low-income families compared to CGC students (e.g., Terenzini et al., 1996). Moreover, FGC students are more likely than CGC students to be Hispanic, African American, or members of other racial/ethnic groups that are underrepresented on campuses (e.g., Saenz et al., 2007). Although there are a number of societal stereotypes that are specific to these social groups, many of the stereotypes about people with low SES and racial/ethnic minorities are overlapping and intersecting (Bullock, 2008). For example, past research has found that people with low SES are stereotyped as being unintelligent, uneducated, and unmotivated (e.g., Christopher & Shlenker, 2000; Cozzarelli, Wilkinson, & Tagler, 2001; Johannesen-Schmidt & Eagly, 2002), while Hispanics and African Americans are stereotyped as being lower class, poor, uneducated, unintelligent, and lazy (e.g., Devine & Elliot, 1995; Niemann, 2001). To what extent might societal stereotypes about social class and race interfere with FGC students' achievement?

Social Identity Threat and Underperformance

Research and theory on stereotype threat (Spencer et al., 2016; Steele & Aronson, 1995), and social identity threat (Purdie-Vaughns, Steele, Davies, Ditlman, & Crosby, 2008; Steele,

Spencer, & Aronson, 2002), would suggest that FGC students could be underachieving in college because they are contending with the prospect of confirming these negative stereotypes about people with low SES and racial minorities. The current research represents an initial attempt to explicitly characterize FGC students' underachievement from a social identity threat perspective.

Stereotype threat. Decades of research have found that students tend to underachieve in situations where their poor performance may end up confirming a negative stereotype about one of their social groups—a social-psychological phenomenon known as *stereotype threat* (Steele & Aronson, 1995). For example, Steele and Aronson (1995) found that African American college students performed worse on a verbal reasoning task than White college students when race was made salient in the situation; when race was not salient in the situation, African American college students performed as well as White college students. In this study, when race was made salient, African American college students likely worried that if they performed poorly on the verbal reasoning task it would have confirmed the societal stereotype that African Americans are unintelligent (Devine & Elliot, 1995; Steele & Aronson, 1995). This concern about how others may interpret their performance tends to usurp cognitive resources that may have otherwise been used on the task at hand, which ultimately results in worse performance (Schmader, Johns, & Forbes, 2008). This stereotype-threat underperformance effect has been replicated with African American college students (e.g., Brown & Day, 2006) and has been demonstrated with college students from other underrepresented racial minority (URM) groups as well, including Hispanic college students (Gonzales, Blanton, & Williams, 2002; Rodriguez, 2014; Schmader & Johns, 2003). Numerous studies have also found that college students from low social-class backgrounds—defined either by low income (e.g., John-Henderson, Rheinschmidt, Mendoza-Denton, & Francis, 2014; Spencer & Castano, 2007) or parents' lack of education (Croizet &

Claire, 1998; Tibbetts, Harackiewicz, Canning, Boston, Priniski, & Hyde, 2016)—may be vulnerable to stereotype-threat underperformance (see also Harrison, Stevens, Monty, & Coakley, 2006; Tine & Gotlieb, 2013). Thus, based on their college-generational status, FGC students may contend with the prospect of confirming negative stereotypes about people from low social-class backgrounds, which could interfere with their academic performance.

Social identity threat and belonging. Since the initial demonstrations of the stereotype threat phenomenon (Spencer, Steele, & Quinn, 1999; Steele & Aronson, 1995), the phenomenon has broadened in scope—beyond underperformance in stereotype-threatening situations—to encompass a wide range of negative consequences that result from being in contexts where one’s social group may be devalued—the broader phenomenon is known as social identity threat (Steele et al., 2002; cf. Purdie-Vaughns et al., 2008). For example, in addition to underperforming on specific tasks in contexts where they can potentially confirm negative group stereotypes, students may also begin to question whether members of their social group belong in these identity-threatening contexts at all, which can harm long-term academic achievement (Walton & Cohen, 2007) and cause avoidance of those contexts in the future (Cheryan, Plaut, Davies, & Steele, 2009; Murphy, Steele, & Gross, 2007). Indeed, past research has found that, compared to CGC students, FGC students are more likely to feel as though they do not belong in college (Stebbleton, Soria, & Huesman, 2014). For FGC students, a reduced sense of belonging in college is associated with less academic help seeking (Winograd & Rust, 2014), worse academic and social adjustment to college, and reduced academic achievement (Ostrove & Long, 2007). Although these findings regarding FGC students’ sense of belonging in college are consistent with a social identity threat perspective, no studies have specifically linked FGC students’ sense

of belonging in college to their concern about confirming negative group stereotypes—the current research attempts to make this link.

Navigating Multiple Social Identities in Identity-Threatening Contexts

Given that FGC students may underachieve and question their belonging in college due to concerns about confirming negative social class stereotypes (Tibbetts et al., 2016), to what extent might FGC students who are also members of URM groups, such as Blacks and Hispanics (i.e., FGC-URM students), be more vulnerable to the negative effects of social identity threat than FGC students who are members of racial majority groups, such as Whites and Asians (i.e., FGC-majority students)? Theoretically, while FGC-majority students may contend with class-based identity threat, FGC-URM students may contend with both class-based and race-based identity threat. Might possessing two negatively stereotyped identities put FGC-URM students at more risk of stereotype-threat underperformance than FGC-majority students? A number of studies have investigated how students navigate multiple social identities under stereotype threat (Gonzales et al., 2002; McGlone & Aronson, 2006; Shih, Pittinsky, & Ambady, 1999; Tine & Gotlieb, 2013). As reviewed in more detail below, findings from these past studies suggest FGC-URM students may be more vulnerable to social identity threat than FGC-majority for two different reasons.

Contending with multiple negatively stereotyped social identities. Past research indicates that students who are members of more than one negatively stereotyped social group in a given context may be more vulnerable to stereotype threat. For example, Gonzales and colleagues (2002) investigated whether Latino women would be more susceptible to stereotype threat than White women and Latino men in a math-testing situation that made both gender and ethnicity salient—an identity-threatening context for both women and Latinos (Schmader &

Johns, 2003; Spencer et al., 1999). Results indicated that gender-based stereotype threat—women performing worse than men when gender is salient in the situation—was particularly true for Latinos, which resulted in Latina women performing worse on the math test compared to White women and Latino men. Consistent with this finding, Tine and Gotlieb (2013) found that students with three negatively stereotyped social identities—female URM students from low-SES backgrounds—performed worse than students with one or two negatively stereotyped identities under stereotype threat. Together, these findings indicate that students with multiple stereotyped social identities in a given context may be particularly vulnerable to social identity threat—a “multiple-minority effect” (Gonzales et al., 2002; Tine & Gotlieb, 2013).

Social identity salience in stereotype-threat contexts. Past research indicates that negatively stereotyped students do not succumb to stereotype-threat underperformance if one of their positively stereotyped social identities is made salient in the situation (McGlone & Aronson, 2006; Rydell, McConnell, & Beilock, 2009; Shih et al., 1999). For example, Shih et al. (1999) found that Asian women’s math performance was harmed by stereotype threat when their gender identity was made salient in the situation, but that their math performance was protected from stereotype threat when their racial identity was made salient. In this same vein, McGlone and Aronson (2006) found that female college students’ performance on a spatial rotation task was harmed when they were reminded of their gender, but their performance was unaffected when they were reminded of a relatively positive social identity (i.e., their status as a student at a private university). Together, these findings indicate that students who possess both negatively and positively stereotyped social identities may be able to avoid the negative impact of social identity threat when their positively stereotyped social identity is also made salient in the situation (Rydell et al., 2009).

Implications for FGC students' in identity-threatening contexts. Thus, from a social identity threat perspective, FGC-URM students should be at more of an academic disadvantage than FGC-majority students. Specifically, in situations where race is salient, FGC-URM students may be vulnerable to race-based social identity threat, whereas FGC-majority students should be unaffected and may even experience a slight benefit for being a member of a positively stereotyped racial group in an identity-threatening situation (Walton & Cohen, 2003). In situations where social class is salient, both FGC-URM and FGC-majority students may be vulnerable to class-based social identity threat; however, FGC-majority students may be able to shift their focus to their majority racial identity and avoid the negative consequences of the class-based threat (Shih et al., 1999). Finally, in situations where both race and social class are salient—which may be common due to overlapping and intersecting stereotypes based race and social class (Bullock, 1995)—FGC-URM students would be vulnerable to two forms social identity threat (based on race and social class), whereas FGC-majority may only be vulnerable to one form (based on social class; Gonzales et al., 2002). Thus, in academic contexts where stereotypes about race and social class may be used to judge students' ability, FGC-URM students should be at more of a disadvantage compared to FGC-majority students.

Chapter 3

Combating Social Identity Threat with Brief Affirmation Interventions

A considerable amount of research has been dedicated to understanding how to protect students from stereotype-threat underperformance (see Walton, Spencer, & Erman, 2013, for a review). The initial focus of this research—primarily conducted in laboratory settings—was to remove stereotype threat from the situation (Steele & Aronson, 1995; Spencer et al., 1999). Although demonstrating that removing the situational threat could equalize performance between groups supported the existence of stereotype threat, removing all of the possible cues that could cause stereotype threat is not a practical strategy for protecting negatively stereotyped students' performance in real-world contexts. Thus, recent research has shifted its focus to developing interventions that allow students to perform up to their potential in the presence of stereotype threat in real-world contexts (Cohen, Garcia, Purdie-Vaughns, Apfel, & Brzustoski, 2009; Harackiewicz et al., 2014; Miyake et al., 2010; Sherman et al., 2013; Walton, Logel, Peach, Spencer, & Zanna, 2015).

Arguably, the most researched intervention for combating stereotype threat is the *values-affirmation* intervention (Cohen & Sherman, 2014). Based on self-affirmation theory (Steele, 1988), values-affirmation interventions are theorized to protect students' performance in identity-threatening contexts by alleviating the threat that poor performance would have on students' personal sense of integrity and competence (Cohen & Sherman, 2014). In a typical values-affirmation intervention students spend a brief amount of time—between 10 and 20 minutes—writing about the values that they find most important in their lives that do not involve academics, such as their relationships with family and friends, their creativity, or their sense of humor. By subtly reminding students that their self-worth is not solely based on their academic

achievement, values-affirmation interventions allow students to focus on the academic tasks themselves—not how others may interpret their performance or how poor performance may threatened their personal sense of competence—leading to improved academic achievement (Cohen, Purdie-Vaughns, & Garcia, 2012).

Research conducted in lab settings have found that students perform significantly better under stereotype threat when they are first given the opportunity to affirm personally relevant values (e.g., Martens, Johns, Greenberg, & Schimel, 2006). Values-affirmation interventions have also been successful in real-world settings over long periods of time. For example, a brief self-affirmation writing exercise—about 15-minutes long—was able to boost African-American middle school students’ grades over the course of a semester, reducing the racial achievement gap by 40% (Cohen, Garcia, Apfel, & Master, 2006). This same effect has been replicated in other field settings, using different negatively stereotyped students, including Hispanic middle school students’ grades over multiple years (Sherman et al., 2013), female college students’ grades in an introductory physics course (Miyake et al., 2010) and FGC students’ grades in a biology course and overall semester GPAs (Harackiewicz, Canning, Tibbetts, Giffen, Blair, Rouse, & Hyde, 2014). Research indicates that these brief values-affirmation interventions can have such lasting positive effects because they bolster students’ sense of belonging (Cook, Purdie-Vaughns, Garcia, & Cohen, 2012; Shnabel, Purdie-Vaughns, Cook, Garcia, & Cohen, 2013; cf. Tibbetts et al., 2016) and tap into recursive processes that can emerge in academic settings (Cohen et al., 2012). Specifically, it appears that values-affirmation interventions disrupt downward performance trajectories for negatively stereotyped students (Cohen et al., 2009), which means the benefits of values-affirmation interventions become more pronounced over time (Yeager & Walton, 2011).

Brief stereotype-threat interventions—including values-affirmation interventions—are sometimes called “wise” interventions (Walton, 2014). The term “wise” has been used to describe people who have an intimate understanding of the experiences of stigmatized group members (Goffman, 1963/1986); the term “wise” has also been used to describe a type of schooling that might aim to reduce the impact of stereotype threat by being sensitive to the diverse experiences of students from underrepresented social groups (Steele, 1997). Brief interventions aimed at combating stereotype threat are considered “wise” when they are developed with an understanding of how students construe themselves, their academic performance, and their social worlds (Walton, 2014; Yeager & Walton, 2011). With this understanding, wise interventions are theorized to make slight changes to disadvantaged students’ construals, which, in turn, alters self-reinforcing processes that unfold over time (Cohen et al., 2009; Walton, 2014; Walton & Cohen, 2007, 2011; Wilson & Buttrick, 2016).

Values-affirmation interventions for FGC students. There is mixed evidence for the effectiveness of values-affirmation interventions for protecting FGC students’ performance in identity-threatening contexts. In a laboratory study, Tibbetts et al. (2016, Study 2) found that a values-affirmation intervention protected FGC students’ performance in stereotype-threat situation—particularly when the intervention materials encouraged students to write about values related to independence (cf. Cook et al., 2012; Covarrubias, Herrmann, & Fryberg, 2016; Shnabel et al., 2013). Moreover, Harackiewicz et al. (2014) delivered a values-affirmation intervention in a large introductory biology course and found that it improved FGC students’ performance in the course—reducing the achievement gap between FGC and CGC students by 50%—while also improving their overall semester GPA. However, Harackiewicz et al. (2016) attempted to replicate this same values-affirmation intervention in the same context a few years

later and found that the intervention was ineffective—it did not significantly improve FGC students’ performance. Indeed, there have recently been a number of failed replications for studies testing the effectiveness of values-affirmation interventions for different negatively stereotyped students in field settings (e.g., Hanselman, Rozek, Grigg, & Borman, 2016; Protzko & Aronson, 2016). More research is needed to gauge the extent to which values-affirmation interventions are viable options for combating stereotype-threat underperformance and reducing achievement gaps (c.f. Bryan, Walton, & Dweck, 2016). The current research tested the efficacy a recently developed values-affirmation intervention for reducing the achievement gap between FGC and CGC students.

Chapter 4

Cultural Mismatch Theory

The current research represents the first attempt to explicitly characterize FGC students' underachievement in terms of social identity threat. Specifically, FGC students—because they are disproportionately from low-SES backgrounds and URM groups—may be concerned about the prospect of confirming negative group stereotypes, which may cause them to question their belonging in college and interfere with their ability to perform up to their academic potential (Steele et al., 2002). In a similar vein, recent research suggests that FGC students may be less accustomed to the cultural norms and expectations of a university environment compared to CGC students, which may contribute to their underachievement—a phenomenon known as *cultural mismatch* (Stephens et al., 2012a). Although theoretically similar to social identity threat, cultural mismatch theory does not account for the possibility that FGC students may be contending with negative group stereotypes. One of the goals of the current research was to test whether FGC students' concern about stereotype threat was related to the experience of cultural mismatch in college.

Cultural Mismatch for FGC Students

FGC students, because they tend to be from low-SES backgrounds, are generally accustomed to norms and expectations of interdependence, such as working together and giving back to one's community (Stephens, Markus, & Townsend, 2007), whereas American universities emphasize and promote cultural norms of independence (e.g., Fryberg & Markus, 2007; Stephens et al., 2012a). Specifically, Stephens and colleagues (2012a) surveyed top administrators and officials at various universities across the United States and found that they were more likely to indicate that their university had independent learning expectations for their

students (e.g., “Learn to express oneself” and “Learn to be a leader”) as opposed to interdependent expectations (e.g., “Learn to work together with others” and “Learn to listen to others”). Thus, cultural mismatch theory posits that FGC students may underachieve in college due to a mismatch in cultural expectations—compared to CGC students, FGC students are more likely to be raised in environments that emphasize and value interdependence, whereas colleges and universities in American emphasize and value independence (Stephens et al., 2012a).

A number of studies have found support for this cultural mismatch hypothesis (Stephens et al., 2012a; Stephens, Townsend Markus, & Phillips, 2012b; cf. Harackiewicz, Canning, Tibbetts, Priniski, & Hyde, 2016). In the most comprehensive test of the cultural mismatch hypothesis to date, Stephens et al. (2012a) aimed to determine the extent to which students’ motives for attending college were associated with their academic achievement over the first two years of college. Consistent with cultural mismatch theory, Stephens et al. (2012a) found that FGC students were more likely to report interdependent motives for attending college, such as wanting to help their families once they graduate and wanting to be a role model for their community; CGC students were more likely to report independent motives for attending college, such as wanting to expand their knowledge of the world and wanting to become an independent thinker. This suggests that while FGC students may experience a cultural mismatch in college, CGC students may experience a cultural match—CGC students’ motives and expectations for college match those espoused by administrators at American universities. Moreover, Stephens et al. (2012a) found that, across both FGC and CGC students, more of interdependent motives for attending college predicted lower grade point averages (GPAs) over their first two years in college, while more of independent motives for attending college predicted higher GPAs.

Finally, Stephens et al. (2012a) found that differences in motives for attending college significantly mediated the achievement gap between FGC and CGC students.

Further support for cultural mismatch theory has been found in laboratory research. Specifically, Stephens et al. (2012a) found that FGC students performed worse on academic tasks after exposure to materials framing college in terms of independence as opposed to interdependence. CGC students' performance on these tasks was unaffected by framing. In a different study, Stephens et al. (2012b), FGC and CGC students were exposed to materials that framed college in terms of independence or interdependence, and then were asked to prepare and deliver a speech. Consistent with hypotheses, when college was framed in terms of independence, FGC students exhibited a larger increase in cortisol than CGC students—a physiological indicator of stress (e.g., Taylor, Burklund, Eisenberger, Lehman, Hilmert, & Lieberman, 2008). When college was framed in terms of interdependence, however, there was no difference in cortisol levels between FGC and CGC students. Similarly, when college was framed in terms of independence, FGC students used fewer positive and more negative words in their speeches compared to CGC students; when college was framed in terms of interdependence, there were no differences in the number of positive and negative words used between FGC and CGC students in their speeches.

Cultural Mismatch and Belonging

Cultural mismatch theory suggests that experiencing cultural mismatch in college should harm students' sense of belonging in college—being reminded that the norms and expectations in college are inconsistent with the norms and expectations to which one is accustomed should cause students to question whether they belong in college (Stephens et al., 2012a; see Walton & Cohen, 2007). However, empirical support for a link between cultural mismatch and sense of

belonging in college is mixed. Specifically, three studies (Harackiewicz et al., 2014, 2016; Tibbetts et al., 2016) have examined the extent to which cultural mismatch is related to students' reporting a reduced sense of belonging in college—two studies found mixed support for the relationship, while the other study found no support for the relationship. In the two studies that found mixed support, having more independent motives for attending college was associated with a stronger sense of belonging in college, but interdependent motives were unrelated to students' sense of belonging (Harackiewicz et al., 2014, 2016). Tibbetts et al. (2016) found that neither interdependent nor independent motives were correlated with sense of belonging in college.

Together, these findings suggest that FGC students may experience a cultural mismatch at most universities in the United States, which could contribute to their underachievement. Although multiple studies have found evidence that cultural mismatch can harm the academic performance of FGC students, it is unclear whether this underperformance is due to FGC students questioning whether they belong in college, which is implied by cultural mismatch theory (Stephens et al., 2012a), or to some other factor. The current research aimed to examine the extent to which cultural mismatch may relate to students' experience of social identity threat, in terms of their concern about confirming negative stereotypes and their sense of belonging in college (Walton & Cohen, 2007, 2011). Moreover, although the theory implicitly posits that cultural mismatch should impact FGC students regardless of their race, recent research found that FGC-URM students may be more vulnerable to cultural mismatch than FGC-majority students—specifically, FGC-URM students reported more interdependent motives for attending college than FGC-majority students (Harackiewicz et al., 2016). Based on this finding, the

current research also aimed to determine if cultural mismatch—like social identity threat—might be more detrimental to the achievement of FGC-URM students than FGC-majority students.

Chapter 5

Overview of Current Research

The overarching goal of the current research was to shed light on the utility of using a social identity threat perspective to understand, and potentially combat, FGC students' underachievement. As discussed above, at least three general findings from past research support the possibility that social identity threat could be a contributing factor to the underachievement of FGC students. First, laboratory research has found that URM students and students from low-SES backgrounds—students who are more likely to be FGC students—underperform on academic tasks under stereotype threat (e.g., John-Henderson et al., 2014; Schmader & Johns, 2003; Steele & Aronson, 1995). Second, numerous survey studies have found that, compared to CGC students, FGC students feel less of a sense of belonging in college (Stebbleton, Soria, & Huesman, 2014) and are more likely to question their belonging in college (Harackiewicz et al., 2014), which is a consequence of experiencing social identity threat in a given context (e.g., Purdie-Vaughns et al., 2008; Walton & Cohen, 2007). Third, a brief intervention that protects against stereotype-threat underperformance (i.e., values affirmation; e.g., Martens et al., 2006) has been found to benefit the academic achievement of FGC students (Harackiewicz et al., 2014; cf. Harackiewicz et al., 2016). This past research has found indirect evidence that social identity threat could be harming FGC students' achievement. The current research aimed to provide more direct evidence of the role that social identity threat plays in contributing to FGC students' underachievement, particularly by also considering how possessing multiple negatively stereotyped identities may put some FGC students at an increased risk for underachievement.

In the current research, two studies were conducted that explored how social identity threat could be contributing to the underachievement of FGC students in college, while also

considering how social identity threat relates to students' sense of belonging in college and cultural mismatch. Study 1 tested the extent to which FGC and CGC students differed in terms of their stereotype-threat concern, sense of belonging in college and cultural mismatch, and whether differences in these variables accounted for differences in real-world academic achievement over the first two year of college between FGC and CGC students. Study 2 tested the extent to which a brief values-affirmation intervention could reduce the achievement gap in GPA between FGC and CGC students by alleviating stereotype-threat concern and bolstering their sense of belonging. Given that FGC students are more likely than CGC students to be URMs and from low-SES backgrounds, both studies in the current research considered how social class and race might interact to affect the social experience and academic achievement of FGC students.

Based on research indicating that possessing multiple negatively stereotyped identities in a given context may make students more vulnerable to stereotype threat (Gonzales et al., 2002; Tine & Gotlieb, 2013) and that possessing a positively stereotyped identity in a given context may inoculate students from stereotype threat (McGlone & Aronson, 2006; Rydell et al., 2009; Shih et al., 1999), the current research tested a *multiple minority* hypothesis (Gonzales et al., 2002; Tine & Gotlieb, 2013). The *multiple minority* hypothesis posits that FGC-URM students—because they are likely contending with negative stereotypes about both their social class and race—should be at more of an academic disadvantage than FGC-majority students. Specifically, it was hypothesized that, overall, (1) FGC students should be at more of an academic disadvantage than CGC students, but that this disadvantage should be more pronounced for FGC-URM than FGC-majority students. Specifically, (2) the disparity between FGC-URM and CGC students should be larger than the disparity between FGC-majority and CGC students, and

(3) FGC-URM students should be at more of an academic disadvantage when specifically compared to FGC-majority students.

Chapter 6

Study 1: How Contending with Negative Stereotypes Can Contribute to First-Generation-College Students' Academic Underachievement

The primary goal of the current study was to test the hypothesis that FGC students contend with more concerns about confirming negative group stereotypes than CGC students, and that this concern about confirming negative stereotypes may harm FGC students' academic achievement. To test this hypothesis, first-semester FGC and CGC students completed a laboratory survey measuring their concern about confirming negative stereotypes about their race, socio-economic background, and college-generational status. Their GPAs over their first two years of college were then obtained from the university registrar. Consistent with the multiple minority hypothesis, it was hypothesized that FGC students would report more stereotype-threat concern than CGC students, but also, that FGC-URM students would report more stereotype-threat concern than FGC-majority and CGC-majority students—particularly with regard to stereotypes about race—and that these differences in stereotype-threat concern would account for achievement gaps between FGC and CGC students, and between FGC-URM and majority students.

A secondary goal of the current study was to explore the extent to which stereotype-threat concern may be related to students' sense of belonging in college and cultural mismatch. The survey participants completed also contained items measuring their sense of belonging in college and items that gauge cultural mismatch—interdependent and independent motives for attending college. It was hypothesized that more stereotype-threat concern would be related to feeling less of a sense of belonging in college and more of a cultural mismatch (Stephens et al., 2012a)—

specifically, more stereotype-threat concern would be associated with being more interdependently, but less independently, motivated to attend college.

The current study also explored whether students' sense of belonging in college and cultural mismatch could account for achievement gaps between FGC and CGC students and between FGC-URM and majority students. Specifically, it was hypothesized that FGC students would report less of sense of belonging, more interdependent motives, and less independent motives for attending college than CGC students, but also that FGC-URM students would report less of sense of belonging, more interdependent motives, and less independent motives for attending college than FGC-majority and CGC-majority students, and that these differences in belonging and motives would account for achievement gaps between FGC and CGC students, and between FGC-URM and majority students.

The final goal of the current study was to examine the extent to which stereotype-threat concern, sense of belonging, and cultural mismatch would predict different academic trajectories for FGC and CGC students over the course their first two years in college. First, it was hypothesized that FGC students would have steeper downward academic trajectories than CGC students, and this effect may be particularly true for FGC-URM students (Cohen et al., 2009). Finally, it was hypothesized that differences in stereotype-threat concern, sense of belonging in college, and cultural mismatch would account for these differences in academic trajectories.

Method

Participants and Procedure

Participants in this study were recruited from the University of Connecticut's psychology participant pool during the Fall 2014 semester and were compensated with partial course credit for their participation. The study was advertised as being interested in understanding students'

attitudes and experiences in college. Participants completed a 25-minute survey on desktop computers in individual cubicles. The survey contained, among other items and scales,¹ items measuring stereotype-threat concern, sense of belonging in college, and interdependent and independent motives for attending college. After completing the survey, the experimenter requested participants' consent to access their semester GPAs and credits earned from the university registrar over the following four semesters (Fall 2014–Spring 2016).

A total of 224 first-semester students completed the study; however, one student did not provide race/ethnicity information—a variable that was vital for testing the current study's hypotheses—which left a sample 223 participants ($M_{AGE} = 18.25$, $SD_{AGE} = 0.96$). In this sample, 58% of the participants were FGC students; 42% of the participants were CGC students.² About 69% of the sample was female. As expected, gender did not systematically vary by college generational status, $\chi^2 = 0.12$, $p = .727$ (68% of FGC students were female; 70% of CGC students were female). The average annual household income for this sample while growing up was about \$70,000. As expected, and consistent with the idea that educational attainment and income are proxies for social class (Hollingshead, 1975), FGC students reported significantly lower annual household incomes than CGC students, $t(211) = -5.76$, $p < .001$ (the average income for FGC students was about \$63,000; the average income for CGC students was about \$81,000). About 79% of the sample was racial majority students (155 White, 20 Asian); the remaining 21% of sample was URM students (17 Black, 16 Hispanic, 1 Middle Eastern, 12 Multiracial or Other). As expected, FGC students were significantly more likely than CGC students to be URM, $\chi^2 = 19.58$, $p < .001$ (31% of FGC students were URM; 7% of CGC students were URM). Specifically, the sample consisted of 40 FGC-URM students, 90 FGC-majority students, 6 CGC-URM students, and 87 CGC-majority students.

Survey Measures

Stereotype-threat concern. The extent to which participants were concerned about confirming negative stereotypes (i.e., stereotype-threat concern) as function of multiple social identities was measured using nine items adapted from previous research (Marx & Goff, 2005). The same three items gauged stereotype-threat concern based on participants' race, socio-economic background, and college-generational status. An example item was, "I worry that people's evaluations of me will be affected by their perceptions of people with my [socio-economic background]"—in the other versions of the items, the portion in brackets was replaced with "race/ethnicity" and "college-generational status". Participants were provided with brief descriptions of socio-economic background and college-generational status before responding to those items (see Appendix A for these descriptions). Three separate composite variables were created: stereotype-threat concern based on race/ethnicity (STC-Race; three items; $\alpha = .86$), stereotype-threat concern based on socio-economic background (STC-SES; three items; $\alpha = .88$), and stereotype-threat concern based on college-generational status (STC-CG; three items; $\alpha = .91$). Responses to these items were measured on 1 (*I disagree completely*) to 13 (*I agree completely*) scales with higher numbers indicating more stereotype-threat concern.

Sense of belonging in college. The extent to which participants felt a sense of belonging at the University of Connecticut was measured using a combination of 12 items adapted from previous research (Soria & Stebleton, 2012; Walton & Cohen, 2007). Example items were, "I feel a sense of belonging at the University of Connecticut" and "I feel as though I 'fit in' at the University of Connecticut". Responses to these items were measured on 1 (*I disagree completely*) to 13 (*I agree completely*) scales and displayed excellent internal reliability ($\alpha =$

.92). Responses to these items were then averaged to create a composite *sense of belonging* variable with higher numbers indicating a stronger sense of belonging in college.

Motives for attending college. Participants' motives for attending college were measured using 12 items adapted from previous research (Stephens et al., 2012a). Six of these items gauged the extent to which participants were interdependently motivated to attend college. Example items for interdependent motives were, "I am motivated to attend college to help my family after I'm done with college" and "I am motivated to attend college to give back to my community". The six items measuring interdependent motives for attending college displayed good internal reliability ($\alpha = 0.81$). The other six items gauged the extent to which participants were independently motivated to attend college. Example items for independent motives were, "I am motivated to attend college to expand my knowledge of the world" and "I am motivated to attend college to explore new interests". The six items measuring independent motives for attending college displayed good internal reliability ($\alpha = 0.87$). Responses to these items were measured on 1 (*I disagree completely*) to 13 (*I agree completely*) scales with higher numbers indicating more motivation.

Standardized test scores. Participants' college readiness was conceptualized as their self-reported scores on the math and verbal sections of the SAT. Specifically, at the end of the survey, participants responded to two open-response questions about their math and verbal SAT scores, "What was your [Math, Verbal] SAT score? (If you can't remember your exact score, please give us your best guess)." Because of the open-response format for these questions, and omitting questions asking about scores on the Writing portion of the SAT or scores on the ACT, responses to these questions required extensive cleaning.³

Academic Achievement

For participants who consented, GPAs and credits earned for the Fall 2014, Spring 2015, Fall 2015, and Spring 2016 semesters were obtained from the university registrar. From these data, three academic achievement variables were created: 1) *first-year GPA* was the average GPA for the Fall 2014 and Spring 2015 semesters weighted by credits earned for each semester; 2) *second-year GPA* was the average GPA for the Fall 2015 and Spring 2016 semesters weighted by credits earned for each semester; and 3) *cumulative two-year GPA* was the average GPA from all four semesters weighted by credits earned for each semester.

Results

Consent Rates

Of the 223 participants who completed the study and provided race/ethnicity information, 192 participants gave their consent to allow researchers to access their academic information from the university registrar—a consent rate of 86%. Because 10 participants' SAT scores were unable to be determined based on their responses to the survey, 182 participants had first-year GPA and SAT data: 30 FGC-URM students, 78 FGC-majority students, 3 CGC-URM students, and 71 CGC-majority students. Because 14 participants did not enroll in classes during the second year of the study, 168 participants had second-year GPA, cumulative two-year GPA, and SAT data: 27 FGC-URM students, 74 FGC-majority students, 1 CGC-URM student, and 66 CGC-majority students.⁴

Data-Analytic Strategy

Planned comparisons. As indicated above, few CGC-URM students ($n = 6$) were recruited into this study, which translated into having few CGC-URM students with first-year ($n = 3$) or second-year ($n = 1$) GPA data. In order to test the hypotheses of the current study with so

few CGC-URM students, three sets of planned comparisons were run. In each set of planned comparisons, two specific research questions were tested—five of these six questions addressed the hypotheses of the current study (see Table 1 for weights for planned comparisons). Specifically, in the first set of planned comparisons—which used all four cells of the design—contrast 1.2 tested the difference between FGC and CGC students, controlling for race (i.e., a college-generation effect). The second and third sets of planned comparisons focused exclusively on the three cells of the design with most of the data, ignoring CGC-URM students. In the second set of planned comparisons, contrast 2.1 tested the difference between FGC-URM students and the combination of FGC-majority and CGC-majority students (i.e., a FGC-URM effect), while contrast 2.2 tested the difference between FGC-majority and CGC-majority students (i.e., a college-generation effect for majority students). In the third set of planned comparisons, contrast 3.1 tested the extent to which FGC-URM and FGC-majority students differed from CGC-majority students (i.e., a focused college-generational status effect), while contrast 3.2 tested the difference between FGC-URM and FGC-majority students (i.e., a race effect for FGC students).

Associations between Different Threats, Belonging, Motives, and Achievement

Table 2 displays the bivariate correlations below the diagonal and the partial correlations above the diagonal (controlling for SAT scores) for the variables in study 1. It was hypothesized that more stereotype-threat concern would relate to less of a sense of belonging in college and more cultural mismatch (i.e., being more interdependently, but less independently, motivated to attend college). Moreover, based on cultural mismatch theory (Stephens et al., 2012a), it was hypothesized that more cultural mismatch would be associated with less of a sense of belonging

in college (cf. Tibbetts et al., 2016). Finally, it was also hypothesized that more stereotype-threat concern, less belonging, and more cultural mismatch would predict lower GPAs.

Associations between stereotype-threat concerns. There was quite a bit of overlap in the stereotype-threat concerns based on social class and race. As expected, the stereotype-threat concerns of the two social class identities—socio-economic background and college-generational status—were highly correlated ($r = .61, p < .001$). With that said, results indicated that concern about confirming negative stereotypes about race was more related to concern about confirming negative stereotypes about socio-economic background ($r = .50, p < .001$) than college-generational status ($r = .39, p < .001$). These relationships remained significant even after controlling for participants' SAT scores.

How stereotype-threat concerns relate to belonging and motives. As expected, results indicated that concerns about confirming negative group stereotypes was associated with a reduced sense of belonging college, and there was some evidence that stereotype-threat concern was associated with cultural mismatch. Specifically, more stereotype-threat concern based on race ($r = -.19, p = .005$), socio-economic background ($r = -.24, p < .001$), and college-generational ($r = -.24, p < .001$) all predicted less of a sense of belonging in college.

Interestingly, these associations became weaker after controlling for participants' SAT scores, particularly with regard to stereotype-threat concern based on race (partial $r = -.11, p = .144$).

More stereotype-threat concern was also associated with having more interdependent motives for attending college—an indicator of cultural mismatch (Stephens et al., 2012a). Specifically, more stereotype-threat concern based on race ($r = .25, p < .001$), socio-economic background ($r = .15, p = .028$), and college-generational status ($r = .14, p = .038$) all predicted more interdependent motives for attending college. Interestingly, these associations became

weaker after controlling for SAT scores, particularly with regard to stereotype-threat concern based on college-generational status (partial $r = .03$, $p = .659$). Interestingly, stereotype-threat concern was not related to participants' independent motives for attending college.

Belonging and motives. Counter to expectations, cultural mismatch was not associated with students' sense of belonging in college. Specifically, sense of belonging in college was not significantly correlated with students' interdependent ($r = .02$, $p = .797$) or independent ($r = .03$, $p = .626$) motives for attending college. These relationships remained non-significant even after controlling for SAT scores.

Associations with academic achievement. At the bivariate level, more stereotype-threat concern during one's first semester in college was related to worse academic achievement by the end of the first-year of college—this was the case for stereotype-threat concern based on race ($r = -.16$, $p = .023$), socio-economic background ($r = -.16$, $p = .031$), and college-generational status ($r = -.20$, $p = .006$). Although none of the stereotype-threat concern variables predicted year-two achievement, stereotype-threat concern based on race ($r = -.19$, $p = .010$) and college-generational status ($r = -.16$, $p = .037$) predicted lower cumulative two-year GPA. After controlling for SAT scores, however, all but two of these relationships became non-significant—stereotype-threat concern based on race still predicted lower first-year GPA ($r = -.17$, $p = .029$) and lower cumulative two-year GPA ($r = -.15$, $p = .050$) after controlling for SAT scores.

Group Differences in Stereotype-Threat Concern, Belonging, Motives, and Achievement

Below are the findings testing for group differences based on college-generational status and race for stereotype-threat concern, sense of belonging in college, interdependent and independent motives for attending college, and achievement (see Tables 3 and 4). Each subsection focuses on one of the five planned comparisons that tested a specific hypothesis from

the current study. In all of the analyses below, when GPA was classified as the dependent variable, participants' self-reported SAT scores were included as a covariate to control for prior achievement (Steele, 1997).

College-generational status differences controlling for race. This section focuses exclusively on the results from contrast 1.2, which compared FGC and CGC students while controlling for the influence of participants' race. In these analyses, contrasts 1.1 and 1.2 were run in multiple regression models.

Stereotype-threat concern. It was hypothesized that FGC students would report more stereotype-threat concern based on their social class and race than CGC students. In general, this hypothesis was supported—results indicated that FGC students contend with more concerns about confirming negative group stereotypes than CGC students, particularly with regard to stereotypes regarding social class (see Figure 1). Specifically, compared to CGC students, FGC students reported more stereotype-threat concern based on their socio-economic background, $\beta = -.15$, $t(220) = -2.16$, $p = .032$, $d = -.30$, and college-generational status, $\beta = -.25$, $t(220) = -3.68$, $p < .001$, $d = -.51$. Even after controlling for participants' race, FGC students reported being slightly more stereotype-threat concern based on their race, but this difference was not significant, $\beta = -.11$, $t(220) = -1.94$, $p = .054$, $d = -.27$.

Belonging and motives. It was hypothesized that FGC students would report less of a sense of belonging in college and indicate more of a cultural mismatch (based on their motives for attending college) compared to CGC students. These hypotheses were not supported—specifically, FGC and CGC students did not significantly differ based on their sense of belonging in college, $\beta = -.03$, $t(220) = -0.41$, $p = .684$, $d = -.06$, interdependent motives for attending

college, $\beta = -.11$, $t(220) = -1.55$, $p = .123$, $d = -.22$, or independent motives for attending college, $\beta = .09$, $t(220) = 1.23$, $p = .221$, $d = .17$.

Academic achievement. Counter to expectations, results indicated that an achievement gap between FGC and CGC students did not emerge after controlling for participants' race (see Figure 2). Specifically, FGC students received lower first-year GPAs than CGC students, but this difference did not reach statistical significance, $\beta = .13$, $t(178) = 1.80$, $p = .073$, $d = .29$. Moreover, results indicated that FGC and CGC students did not significant differ in terms of their second-year GPA, $\beta = .08$, $t(164) = 1.01$, $p = .314$, $d = .17$, or their cumulative two-year GPA, $\beta = .12$, $t(164) = 1.58$, $p = .116$, $d = .24$.

Accounting for college-generational status achievement gaps controlling for race. It was hypothesized that the achievement gap between FGC and CGC students would be explained by differences in stereotype-threat concern, sense of belonging, or motives for attending college between FGC and CGC students. However, results from mediational analyses indicated that none of these variables accounted for differences in achievement between FGC and CGC students (see the top section of Table 5), which may not be surprising given that the expected achievement gap between FGC and CGC students did not emerge in the first place.

College-generational status differences ignoring CGC-URM students. This section focuses exclusively on the results from contrast 3.1, which compared the combination of FGC-URM and FGC-majority students with CGC-majority students. In these analyses, contrasts 3.1 and 3.2 were run in multiple regression models.

Stereotype-threat concern. As hypothesized, compared to CGC-majority students, FGC students reported more concern about confirming negative stereotypes about their race, $\beta = -.44$, $t(214) = -7.64$, $p < .001$, $d = -.64$, socio-economic background, $\beta = -.26$, $t(214) = -3.89$, $p < .001$,

$d = -.43$, and college-generational status, $\beta = -.28$, $t(214) = -4.05$, $p < .001$, $d = -.55$ (see Figure 3).

Belonging and motives. It was hypothesized that FGC students would report less of a sense of belonging in college and more of a cultural mismatch (based on their motives for attending college) compared to CGC-majority students. Results provided mixed support for these hypotheses (see Figure 3). As expected, FGC students reported being more interdependently motivated to attend college than CGC-majority students, $\beta = -.24$, $t(214) = -3.58$, $p < .001$, $d = -.40$. Counter to expectations, no differences were found between the combination of FGC students and CGC-majority students in terms of their sense of belonging college, $\beta = .08$, $t(214) = 1.10$, $p = .274$, $d = .06$, or independent motives for attending college, $\beta = -.04$, $t(214) = -0.60$, $p = .550$, $d = .02$.

Academic achievement. It was hypothesized that the combination of FGC students would earn lower GPAs than CGC-majority students—results generally supported this hypothesis (see Figure 4). Consistent with hypotheses, compared to CGC-majority students, the combination of FGC students received significantly lower first-year GPAs, $\beta = .22$, $t(175) = 2.86$, $p = .005$, $d = .43$, and cumulative two-year GPAs, $\beta = .20$, $t(163) = 2.53$, $p = .012$, $d = .41$. In line with hypotheses, the combination of FGC students received lower second-year GPAs than CGC-majority students, but this difference did not reach statistical significance, $\beta = .16$, $t(163) = 1.92$, $p = .057$, $d = .31$.

Accounting for college-generational status achievement gaps ignoring CGC-URM students. It was hypothesized the achievement gap between the combination of FGC students and CGC-majority students would be explained by differences in stereotype-threat concern, sense of belonging in college, and motives for attending college. However, results from

mediational analyses indicated that none of these variables accounted for differences in achievement between the combination of FGC students and CGC-majority students (see the middle section of Table 5).

College-generational status differences for majority students. This section focuses exclusively on the results from contrast 2.2, which compared FGC-majority and CGC-majority students. In these analyses, contrasts 2.1 and 2.2 were run in multiple regression models.

Stereotype-threat concern. It was hypothesized that FGC-majority students would report more concern about confirming negative group stereotypes related to their social class, but not their race, compared to CGC-majority students. Results provided mixed support for these hypotheses (see Figure 3). Specifically, as hypothesized, FGC-majority students reported more concern about confirming negative stereotypes related to their college-generational status than CGC-majority students, $\beta = -.22$, $t(214) = -3.27$, $p = .001$, $d = -.50$. However, counter to expectations, FGC-majority and CGC-majority students did not differ in terms of their concern about confirming negative stereotypes related to their socio-economic background, $\beta = -.11$, $t(214) = -1.62$, $p = .107$, $d = -.25$. As expected, FGC-majority and CGC-majority students did not significantly differ in terms of their concern about confirming negative group stereotypes based on race, $\beta = -.08$, $t(214) = -1.39$, $p = .165$, $d = -.24$.

Belonging and motives. It was hypothesized that FGC-majority students would report less of a sense of belonging in college and indicate more of a cultural mismatch (based on their motives for attending college) compared to CGC-majority students. These hypotheses were not supported (see Figure 3)—specifically, FGC-majority and CGC-majority students did not significantly differ based on their sense of belonging in college, $\beta = -.04$, $t(214) = -0.60$, $p = .547$, $d = -.10$, their interdependent motives for attending college, $\beta = -.10$, $t(214) = -1.57$, $p =$

.117, $d = -.23$, or their independent motives for attending college, $\beta = .09$, $t(214) = 1.27$, $p = .203$, $d = .19$.

Academic achievement. It was expected that an achievement gap would emerge between FGC-majority and CGC-majority students; however, this was only the case for first-year GPA (see Figure 4). Specifically, FGC-majority students received significantly lower first-year GPAs than CGC-majority students, $\beta = .16$, $t(175) = 2.28$, $p = .024$, $d = .39$. However, the achievement gap between FGC-majority and CGC-majority students did not emerge for second-year GPA, $\beta = .10$, $t(163) = 1.38$, $p = .170$, $d = .22$, nor did this achievement gap emerge for cumulative two-year GPA, $\beta = .14$, $t(163) = 1.86$, $p = .064$, $d = .30$.

Accounting for college-generational status achievement gaps for majority students. It was hypothesized the achievement gap between FGC-majority and CGC-majority student would be explained by differences in stereotype-threat concern, sense of belonging in college, and motives for attending college. However, results from mediational analyses indicated that none of these variables accounted for differences in achievement between FGC-majority and CGC-majority students (see the bottom section of Table 5).

Differences between FGC-URM and majority students. This section focuses exclusively on the results for contrast 2.1, which compared FGC-URM students with the combination of FGC-majority and CGC-majority students. In these analyses, contrasts 2.1 and 2.2 were run in multiple regression models.

Stereotype-threat concern. It was hypothesized that FGC-URM students would indicate being more concerned about confirming negative stereotypes based on their social class and race compared to FGC-majority and CGC-majority students—these hypotheses were confirmed. Specifically, compared to FGC-majority and CGC-majority students, FGC-URM students

reported more concern about confirming negative stereotypes about their race, $\beta = -.59$, $t(214) = -10.71$, $p < .001$, $d = -1.86$, their socio-economic background, $\beta = -.28$, $t(214) = -4.29$, $p < .001$, $d = -.75$, and their college-generational status, $\beta = -.16$, $t(214) = -2.42$, $p = .016$, $d = -.41$.

Belonging and motives. It was hypothesized that FGC-URM students would report less of a sense of belonging in college and indicate more of a cultural mismatch (based on their motives for attending college) compared to FGC-majority and CGC-majority students—results provided mixed support for these hypotheses (see Figure 3). Consistent with hypotheses, compared to FGC-majority and CGC-majority students, FGC-URM students indicated feeling less of a sense of belonging in college, $\beta = .17$, $t(214) = 2.57$, $p = .011$, $d = .45$, and being more interdependently motivated to attend college than FGC-majority and CGC-majority students, $\beta = -.25$, $t(214) = -3.83$, $p < .001$, $d = -.67$. However, FGC-URM students also reported being more independently motivated to attend college compared to FGC-majority and CGC-majority students, $\beta = -.18$, $t(214) = -2.62$, $p = .009$, $d = -.46$ —which is inconsistent with the hypothesis that FGC-URM student would experience more of a cultural mismatch than FGC-majority and CGC-majority students in college.

Academic achievement. The expected achievement gap between FGC-URM students and the combination of FGC-majority and CGC-majority students did not emerge. (see Figure 4). Specifically, FGC-URM students did not significantly differ from majority students in terms of first-year GPAs, $\beta = .14$, $t(175) = 1.92$, $p = .057$, $d = .08$, second-year GPAs, $\beta = .11$, $t(163) = 1.48$, $p = .142$, $d = .04$, or cumulative two-year GPAs, $\beta = .14$, $t(163) = 1.90$, $p = .059$, $d = .42$..

Accounting for achievement gaps between FGC-URM and majority students. It was hypothesized the achievement gap between FGC-URM students and the combination of FGC-majority and CGC-majority students would be explained by differences in stereotype-threat

concern, sense of belonging in college, and motives for attending college. However, results from mediational analyses indicated that none of these variables accounted for differences in achievement between FGC-URM students and the combination of FGC-majority and CGC-majority students (see the top portion of Table 6).

Racial differences for FGC students. This section focuses exclusively on the results for contrast 3.2, which compared FGC-URM students with FGC-majority students. In these analyses, contrasts 3.1 and 3.2 were run in multiple regression models.

Stereotype-threat concern. It was hypothesized that FGC-URM students would be more concerned the FGC-majority students about confirming stereotypes based on race, but not stereotypes based on social class (i.e. socio-economic background and college-generational status)—results provided mixed support for these hypotheses (see Figure 3). Specifically, and as expected, FGC-URM students reported more concern about confirming negative stereotypes about their race than FGC-majority students, $\beta = -.453$, $t(214) = -9.32$, $p < .001$, $d = -1.56$. However, FGC-URM students also reported more concern about confirming negative stereotypes based on their socio-economic background than FGC-majority students, $\beta = -.22$, $t(214) = -3.31$, $p = .001$, $d = -.59$. As expected, no difference was found between stereotype-threat concern based on college-generational status between FGC-URM and FGC-majority students, $\beta = -.06$, $t(214) = -0.94$, $p = .350$, $d = -.17$.

Belonging and motives. It was hypothesized that FGC-URM students would report less of a sense of belonging in college and indicate more of a cultural mismatch (based on their motives for attending college) compared to FGC-majority students (see Figure 3)—results provided mixed support these hypotheses. As hypothesized, FGC-URM students were more interdependently motivated to attend college, $\beta = -.20$, $t(214) = -2.91$, $p = .004$, $d = -.62$, and

reported a lower sense of belonging in college compared to FGC-majority students, $\beta = .18$, $t(214) = 2.61$, $p = .010$, $d = .49$. However, counter to expectations, FGC-URM students were also more independently motivated to attend college than FGC-majority students, $\beta = -.20$, $t(214) = -2.92$, $p = .004$, $d = -.58$.

Academic achievement. It was hypothesized that FGC-URM students would underachieve compared to FGC-majority students—results did not support this hypothesis for any of the achievement outcomes (see Figure 4). There were no significant differences between FGC-URM and FGC-majority students for first-year GPA, $\beta = .07$, $t(175) = 0.96$, $p = .338$, $d = .19$, second-year GPA, $\beta = .07$, $t(163) = 0.90$, $p = .367$, $d = .20$, or cumulative two-year GPA, $\beta = .09$, $t(163) = 1.13$, $p = .260$, $d = .25$.

Accounting for racial achievement gaps for FGC students. It was hypothesized the achievement gap between FGC-URM and FGC-majority students would be explained by differences in stereotype-threat concern, sense of belonging in college, and motives for attending college. However, results from mediational analyses indicated that none of these variables accounted for differences in achievement between FGC-URM and FGC-majority students (see the bottom portion of Table 6).

Predicting Two-Year Achievement Trajectories

The next set of analyses explored the extent to which FGC and CGC students' GPA trajectories over the first two years of college differed based on varying levels of stereotype-threat concern during their first semester in college. Specifically, it was hypothesized that more stereotype-threat concern would predict downward semester-GPA trajectories—that GPAs would drop semester by semester—but that this would be more true for FGC students than CGC students (contrasts 1.2 and 3.1), for FGC-majority students than CGC-majority students (contrast

2.2), for FGC-URM students than majority students (contrast 2.1), and for FGC-URM students than FGC-majority students (3.2). In addition to testing the impact of stereotype-threat concern on semester-GPA trajectories, these analyses also tested the possibility that a low sense of belonging in college and cultural mismatch would also predict downward GPA trajectories. Longitudinal data analyses using multilevel modeling were used to test these hypotheses (Peugh & Enders, 2005; Raudenbush & Bryk, 2002).

Random-intercept model. First, a random-intercept model was run to determine the extent to which participants' semester GPAs were related to one another (i.e., the amount of dependence in the semester GPA data). Semester GPA was the level-1 dependent variable. Semester was the level-1 unit of analysis; participants were the level-2 unit of analysis. As Table 5 shows, results indicated that the average variability in semester GPAs within participant was .430 (σ^2), while the average variability in semester GPAs between participants (τ_{00}) was .258. This translates to an intra-class correlation (ICC) of .375, indicating that about 38% of the variance in semester GPAs can be explained by the fact that they are grouped within participant. These findings indicate that there is a considerable amount of dependence in the data, and that an analysis that allows for dependence—such as longitudinal multilevel modeling—is necessary to analyze the semester GPA data (Raudenbush & Bryk, 2002).

Simple linear growth models. Next, a series of simple linear growth models were run to determine the average semester-GPA trajectory across all participants, and to determine the best between-participant and within-participant variance-covariance structures for these data (see Table 7, models A, B, and C). In these models, a semester variable was included at level 1, which was centered at the first semester (0 = Fall 2014, 1 = Spring 2015, 2 = Fall 2015, 3 = Spring 2016). Model A tested an unstructured between-participant variance-covariance structure

(estimates random effects for the intercept and slope, and estimates the extent to which these random effects are related); model B tested a diagonal between-participant variance-covariance structure (estimates random effects for the intercept and slope, but assumes these random effects are not related); model C tested a diagonal between-participant variance-covariance structure with a first-order auto-regressive within-participant covariance structure (assumes semester GPAs that are closer together are more related than semester GPAs that are farther apart; e.g., that Fall 2014 GPA would be more correlated with Spring 2015 GPA than Fall 2015 GPA).

As shown in Table 7, models A, B, and C all indicated that participants' average Fall 2014 GPA was about 3.28, and that, as expected, participants' GPAs tended to drop by about .66 points each semester during their first four semesters in college. Moreover, models A, B, and C all indicated that there was significant variability within participant (i.e., the extent to which each participants' GPAs varied across semester; σ^2), around the intercept (i.e., between participants' Fall 2014 GPAs; τ_{00}) and around the slope (i.e., between participants' semester-GPA trajectories over their first four semesters; τ_{11}). Model A indicated that the variability around participants' Fall 2014 GPAs was not significantly correlated with the variability around participants' semester-GPA trajectories (τ_{11}); model C indicated that closer semester GPAs were not more correlated than more distant semester GPAs (ρ). Given that these additional parameters were non-significant and provided no clear benefit to overall model fit, it was determined that model B fit the data best. Thus, a diagonal between-participant variance-covariance structure was used in all subsequent models.

Testing the academic-trajectory hypotheses. As shown in Tables 8, 9, and 10, a series of linear growth models were run that explored whether more stereotype-threat concern, less of a sense of belonging, more interdependent motives for attending college, and less independent

motives for attending college predicted downward GPA trajectories across participants' first four semesters in college. These models also tested whether these predicted trajectories differed between FGC and CGC students (contrasts 1.2 and 3.1), between FGC-majority and CGC-majority students (contrast 2.2), between FGC-URM students and the combination of FGC-majority and CGC-majority students (contrast 2.1) and between FGC-URM and FGC-majority students (contrast 3.2).

Put simply, results did not support the academic-trajectory hypotheses (see Tables 8, 9, and 10). In general, the expected downward trajectory of semester-GPA did not emerge. Specifically, after including SAT scores, the contrasts testing group differences, and the other predictors in the models, there was no evidence of downward GPA trajectories across the four semesters (see Tables 8, 9, and 10). Moreover, results indicated the GPA trajectories did not significant differ between FGC and CGC students (semester*contrast 1.2 for all of the models in Table 8; semester*contrast 3.1 for all models in Table 10), between FGC-majority and CGC-majority students (semester*contrast 2.2 for all of the models in Table 9), between FGC-URM and majority students (semester*contrast 2.1 for all of the Models in Table 9), or between FGC-URM and FGC-majority students (semester*contrast 3.2 for all of the Models in Table 10). Also counter to expectations, none of the predictors—stereotype threat concern, sense of belonging, motives for attending college—significantly predicted participants' GPA trajectories across the four semesters (semester*predictor in all of models in Tables 8, 9, and 10). Finally, besides one instance, the extent to which stereotype-threat concern, sense of belonging, or motives for attending college predicted semester-GPA trajectories did not vary between groups (see the semester*contrast*predictor estimates in all of the models in Tables 8, 9, and 10). And, across all models in Tables 8, 9, and 10, the random effects coefficients remain generally stable, which

indicates that none of these models explained any more or less variance than any of the other models.

Summary. Taken together, the results from these longitudinal multilevel models did not support the academic-trajectory hypotheses. Rather, these findings suggest that any achievement gaps between FGC and CGC students, between FGC-majority and CGC-majority students, between FGC-URM and majority students, and FGC-URM and between FGC-majority students emerged early on, and then remained stable over time. Given that the semester-GPA trajectories did differ between groups, it is perhaps not surprising that stereotype-threat concern, sense of belonging, and cultural mismatch were not able to explain differences in GPA trajectories.

Discussion

The goal of Study 1 was to test the general hypothesis that FGC students contend with more negative group stereotypes than CGC students, which would account for differences in achievement between these groups. Taken together, the findings from Study 1 provided mixed support for this general hypothesis.

The stereotype-threat concern findings from Study 1 generally support the multiple minority hypothesis. Specifically, results indicated that FGC-URM students were more concerned about confirming stereotypes based on socio-economic background and race compared to FGC-majority and CGC-majority students. As expected, FGC-URM and FGC-majority reported more concern about confirming negative stereotypes based on their college-generational status compared to CGC-majority students, and these concerns did not differ between FGC-URM and FGC-majority students. Thus, both FGC-URM and FGC-majority may be at a disadvantage compared to CGC-majority students in terms of contending with stereotypes based on college-generational status, but FGC-URM students are at a distinct disadvantage

compared FGC-majority and CGC-majority students in terms of contending with stereotypes based on socio-economic background and race. It is unclear why FGC-URM students were more concerned with stereotypes related to socio-economic background than FGC-majority students—perhaps because stereotypes based on race and SES are sometimes intertwined (Bullock, 1995).

The findings for sense of belonging and cultural mismatch also support the multiple minority hypothesis. Specifically, FGC-majority and CGC-majority did not differ in terms of their sense of belonging in college or their motives for attending college; however, FGC-URM students reported less of a sense of belonging in college and more interdependent motives for attending college—which indicates a cultural mismatch—compared to FGC-majority and CGC-majority students. Interestingly, FGC-URM students also reported more independent motives for attending college than majority students, which is inconsistent with cultural mismatch theory (Stephens et al., 2012a; cf. Tibbetts et al., 2016).

The findings on students' GPAs generally did not support the multiple minority hypothesis. In short, FGC students generally received lower GPAs than CGC students, and this difference did not depend on students' race—FGC-URM students were not at more of academic disadvantage than FGC-majority students in terms of their GPAs. The achievement gap between FGC and CGC students was most pronounced in first-year GPAs, but results from the longitudinal models suggest that this achievement gap remained relatively stable over the two years of the study (as displayed in Figures 2 and 4).

Finally, counter to expectations, results from the mediational models indicated that the achievement gap between FGC and CGC students could not be explained by initial differences in stereotype-threat concern, sense of belonging, or motives for attending college. These non-significant mediation findings could be interpreted in a number of ways. It could be that

stereotype-threat concern, sense of belonging, and motives for attending college play no role in creating and perpetuating the achievement gap between FGC and CGC students. Or, it could be the case that these variables contribute to the achievement gap, but that they were not measured in a way that captured their contribution. Perhaps measuring these constructs in a subtler manner over time would have been a better strategy for gauging their contribution to the achievement gap between FGC and CGC students.

Limitations

Study 1 had two main limitations that warrant mention. First, as discussed above, few CGC-URM students were recruited into the study. This severely limits the conclusions that can be drawn in terms of how college-generational status and race may interact to put certain groups of students at an increased disadvantage. This limitation was addressed in Study 2 by attempting to recruit more participants and not limiting recruitment to first-semester students.

The other limitation concerns how participants provided their scores on their college-entry standardized tests. In all of the analyses in Study 1 that examined GPA, participants' SAT scores were included as covariates to control for prior achievement (Steele, 1997), but the manner in which participants' SAT scores were measured was not ideal. Specifically, participants were asked to provide their scores on the math and verbal sections of the SAT using an open-response format. Because participants were not provided with a section for their writing SAT score or about their ACT scores, responses were quite messy, which required a thorough cleaning process. Consequently, the study may have had biased estimates of participants' SAT scores, which could then call into question the findings from any analysis that used SAT scores as a variable. This limitation was addressed in Study 2 by obtaining participants' scores on college-entry standardized tests from the university registrar.

Chapter 7

Study 2: How a Brief Affirmation Intervention May Protect First-Generation-College Students from Underachievement

The goal of Study 2 was to test whether a wise intervention could reduce or eliminate real-world achievement gaps between FGC and CGC students by alleviating FGC students' concerns about confirming negative group stereotypes and by bolstering their sense of belonging in college. Specifically, this study tested the efficacy of an *affirmation-training* intervention (adapted from Walton et al., 2015). Similar to attributional retraining interventions (Wilson, Damiani, & Shelton, 2002; see also Walton & Cohen, 2007, 2011), in an affirmation-training intervention, participants are first provided with information indicating that it is typical for students at their school to struggle in college initially, but that over time, they begin to academically improve and adjust to college. Next, participants are told that this improvement is due to the fact that students were able to manage their stress by reflecting upon their values and realizing that their self-worth is not completely tied to their academic achievement. Finally, participants are given the opportunity to reflect upon and write about times in their academic lives when they managed their stress in similar ways, which includes writing a personal letter that will ostensibly be given to an incoming freshman the following year. These writing exercises are meant to reinforce the intervention message in a non-threatening manner (Walton et al., 2015; cf. Stone & Fernandez, 2008). By being reminded that their self-worth is not completely tied to their academic performance and then advocating for the usefulness in managing stress this way, affirmation-training interventions are theorized to reduce students' academic pressure and bolster their self-integrity, which allows them to achieve up to their academic potential (Cohen & Sherman, 2014). For this reason, affirmation-training interventions

should be particularly effective for negatively stereotyped students, because their self-integrity may be threatened by the prospect of being judged through the lens of negative group stereotypes (Steele, 1997). To date, the effectiveness of affirmation-training interventions to combat stereotype-threat underperformance has only been tested in one previous study (Walton et al., 2015) that focused on the academic performance of female college students in engineering—a domain in which women are underrepresented, stereotyped as being less capable than men, and may question their belonging (Murphy et al., 2007). Specifically, Walton et al. (2015) found that an affirmation-training intervention significantly improved female engineering college students' GPA—eliminating the achievement gap between male and female students—particularly in specific engineering majors where women were particularly underrepresented.

In order to test the effectiveness of an affirmation-training intervention for FGC students, two comparison conditions were included in the current study: an academic-engagement intervention condition and a no-intervention control condition. On the one hand, participants in the no-intervention control condition did not receive any information about students at their school initially struggling but improving over time, nor did they engage in any writing exercises. On the other hand, participants in the academic-engagement condition completed materials that were almost identical to those in the affirmation-training intervention—including learning about how students at their school initially struggle but improve over time—but they differed on one key theoretical aspect. Instead of being told that students improved by managing their stress by engaging in meaningful, non-academic activities, participants in the academic-engagement condition were told that students improved by finding more effective strategies for studying (e.g., how to take better notes). Based on stereotype threat and self-affirmation theory (Cohen & Sherman, 2014; Yeager & Walton, 2011), only the affirmation-training intervention should

benefit FGC students' academic performance because it targets a social-psychological processes that may be interfering with FGC students' ability to perform up to their potential, namely stereotype threat and belonging uncertainty (Walton & Cohen, 2007; cf. Wilson et al., 2002). By making the academic-engagement condition as similar to the affirmation-training intervention as possible, it provides a stringent test of the effectiveness of affirmation-training interventions, while also shedding light on their psychological mechanism. Are the benefits derived from affirmation-training interventions due to the specific message that students at their school were able to overcome initial academic adversity by engaging in non-academic activities that solidified their self-integrity, or are their benefits simply due to the fact that students learn that they are not alone with regard to any academic difficulties—that other students at their school have struggled academically too and they were able to cope? Study 2 tested this question.

Hypotheses

There were two specific hypotheses for Study 2 with regard to how the affirmation-training intervention would impact academic performance: (1) an *intervention boost* hypothesis and (2) a *reducing achievement gaps* hypothesis. The *intervention boost* hypothesis was concerned with the extent to which the affirmation-training intervention provided a boost to FGC students' GPAs. Specifically, it was hypothesized that FGC students who received the affirmation-training intervention would show a boost in GPAs compared to FGC students who did not receive the affirmation-training intervention. In line with the multiple minority hypothesis, it was hypothesized that this GPA boost would be more pronounced for FGC-URM students compared to FGC-majority students.

The *reducing achievement gaps* hypothesis was concerned with the extent to which the affirmation-training intervention would reduce certain achievement gaps. Specifically, it was

hypothesized that the affirmation-training intervention would reduce or eliminate the achievement gaps between FGC and CGC students. In line with the multiple minority hypothesis, it was hypothesized that affirmation-training intervention would be particularly effective in reducing the achievement gaps between FGC-URM and the other students.

Finally, this study tested the hypothesis that an affirmation-training intervention would benefit FGC students' academic performance by allaying concerns about confirming negative group stereotypes and by bolstering their sense of belonging in college. Past research has found that values-affirmation interventions boost negatively stereotyped students' performance by combating stereotype threat and bolstering students' sense of belonging in school (Cook et al., 2012; Shnabel et al., 2013; cf. Tibbetts et al., 2016), but these effects have not yet been tested using an affirmation-training intervention, nor have they been tested with FGC students. Thus, it was hypothesized that FGC students in the affirmation-training intervention would report less stereotype-threat concern and more of a sense of belonging compared to FGC students who did not receive the affirmation-training intervention. For FGC-majority students, it was hypothesized that the affirmation-training intervention would reduce concerns about confirming stereotypes based on their social class; for FGC-URM students, it was hypothesized that the affirmation-training intervention would reduce concerns about confirming stereotypes based on their social class and race.

Method

Participants

In total, 535 undergraduate students from the University of Connecticut participated in this study ($M_{AGE} = 18.86$ years, $SD_{AGE} = 1.32$). Most of the participants were CGC students ($n = 323$, 60%); the remaining participants were FGC students ($n = 212$, 40%). About 68% of the

sample was female. As expected, gender did not systematically vary by college generational status, $\chi^2 = 0.25$, $p = .617$ (67% of FGC students were female; 69% of CGC students were female). The average annual household income for this sample while growing up was roughly \$75,000. As expected, FGC students reported significantly lower annual household incomes than CGC students, $t(523) = -10.60$, $p < .001$ (average income for FGC students was about \$62,000; average income for CGC students was about \$84,000). About 78% of the sample was racial majority students ($n = 418$); the remaining 22% of the sample was URM students ($n = 117$). As expected, FGC students were significantly more likely than CGC students to be URM, $\chi^2 = 25.55$, $p < .001$ (33% of FGC students were URM; 15% of CGC students were URM). Specifically, the sample consisted of 70 FGC-URM students, 142 FGC-majority students, 47 CGC-URM students, and 276 CGC-majority students.

Procedure

Participants were recruited from the University of Connecticut's psychology participant pool and were compensated with partial course credit for their participation in the laboratory portion of the study, which took place throughout the Fall 2015 semester. The study was advertised on the participant pool website as being interested in students' perceptions and experiences adjusting to college. Upon arrival to the laboratory, participants were seated in individual cubicles and completed a short survey on desktop computers. Participants were then randomly assigned into one of three conditions: (1) an affirmation-training intervention condition, (2) an academic-engagement intervention condition, or (3) a no-intervention control condition. Participants assigned to the two intervention conditions read bogus survey results about junior and senior college students' experiences at the University of Connecticut, engaged in two brief writing exercises, and then moved on to the final portion of the study. Participants

assigned to the no-intervention control condition moved directly to the final portion of the study after completing the short survey. In the final portion of the study, the experimenter asked for participants' permission to access their GPAs and credits earned from the university registrar for the 2015-2016 academic year, and their scores on college-entry standardized tests (SAT and/or ACT). The experimenter also asked for participants' consent to contact them the next semester to complete a modified online version of the survey that they completed in the laboratory.

Laboratory Survey

The survey that participants completed in the laboratory for Study 2 contained the same nine items measuring participants' stereotype-threat concern based on their race ($\alpha = .86$), socioeconomic background ($\alpha = .87$) and college-generational status ($\alpha = .91$). The laboratory survey in Study 2 also measured participants' sense of belonging in college, but used a slightly different set of items ($\alpha = .92$; adapted from Walton & Cohen, 2007).

Intervention Procedures

After completing the laboratory survey, participants in the two interventions conditions were told that, over the last year, the researchers of the study had been conducting a survey on juniors and seniors' experiences adjusting to being a student at the University of Connecticut. Participants were told that the results of this survey are intriguing and similar for students from different majors, genders, ethnicities, and social-class backgrounds, and that the researchers would like their help interpreting the results of the survey (see Appendix C for complete intervention procedures and materials).

Participants in both conditions were then exposed to bogus results from the purported survey of juniors and seniors at the University of Connecticut. The first major result from the survey was that the majority of juniors and seniors reported that they initially felt overwhelmed

managing the workload at the beginning of college. The second major finding was that, although adjusting to college was difficult at first, the majority of juniors and seniors reported that they began to adjust, and that their college experiences became better over time. The third major finding from the survey differed depending on intervention condition.

Affirmation-training intervention. Participants in the affirmation-training intervention condition were told that the third major finding from the survey was that many of these students were able to adjust to life in college by finding ways to manage their stress and find balance—by engaging in activities such as spending time with friends, putting their workload in perspective, going to the gym, and taking mental “time outs”. Participants were then shown nine illustrative quotes from participants of the survey that emphasized this third major finding.

Academic-engagement intervention. Participants in the academic-engagement intervention condition were told that the third major finding from the survey was that many of these students were able to adjust to life in college by finding ways to become more engaged with their coursework, particularly by finding different strategies to help them complete all of their schoolwork and fully understand the material. Participants were then shown to nine illustrative quotes from participants of the survey that emphasized this third major finding.

Writing exercises. After reading the bogus survey results, participants in both intervention conditions were given 20 minutes to write a brief essay on the computer about why they thought the students’ experiences developed in the way that the survey respondents described. Participants were encouraged to include examples from their own experiences.

After finishing their brief essays, participants were asked to re-write their essay using a pen and paper as a personal letter to a future student. Participants were told that these letters

would be delivered to incoming students of the following year as a way to ease their transition to college. Participants placed these letters in envelopes on their desk when they were finished.

Online Follow-up Survey

During the Spring 2016 semester, participants who consented to being contacted in the future were emailed with an online follow-up survey. Participants were compensated \$5 for completing it. The online follow-up surveys contained the same items measuring stereotype-threat concern based on race ($\alpha = .86$), socio-economic background ($\alpha = .87$), and college-generational status ($\alpha = .90$), and the same items measuring sense of belonging in college ($\alpha = .92$) as the surveys completed during the laboratory session. Finally, for participants in the intervention conditions, the online follow-up surveys also contained brief writing exercises that were intended to boost the effectiveness of the intervention they received during their laboratory session.

Intervention-booster writing exercises. Participants in the affirmation-training intervention condition were presented with a list of 10 values in a randomized order (e.g., relationships with family and friends, athletic ability, sense of humor, creativity), and then asked to pick the value that they found most important. Then, participants were asked to write a brief paragraph about why their chosen value is important to them. Participants in the academic-engagement intervention condition were presented with a list of 10 academic behaviors in a randomized order (e.g., taking notes during class, studying for exams, forming a study group, attending office hours), and then asked to pick the behavior that they found most important. Then, participants were asked to write a brief paragraph about why their chosen academic behavior is important to them. These writing exercises were adapted from previous research on values-affirmation interventions (Cohen et al., 2009).

Results

Consent and Response Rates

Of the 535 participants who completed the laboratory portion of the study, 440 participants gave their consent for researchers to obtain their Fall 2016 and Spring 2016 GPAs, and college-entry standardized test scores from the university registrar—a consent rate of 82%. Thirteen participants' standardized test scores were not available, which resulted in a sample size of 427 participants with GPA and standardized test score data: 52 FGC-URM students, 116 FGC-majority students, 38 CGC-URM students, and 221 CGC-majority students.

Of the 535 participants who completed the laboratory portion of the study, 291 participants consented and responded to the online follow-up survey during the Spring 2016 semester—a consent/response rate of 54%: 35 FGC-URM students, 78 FGC-majority students, 21 CGC-URM students, and 157 CGC-majority students. Degrees of freedom in analyses based on the follow-up survey may vary slightly due to attrition.

Differences on Pre-Intervention Survey Measures

The first set of analyses examined the extent to which participants differed in terms of their stereotype-threat concern and sense of belonging college as a function of their college-generational status and race on the pre-intervention survey that they completed in lab (see Figure 5). The top portion of Table 11 displays the means and standard errors for all of the pre-intervention survey measures as a function of participants' college-generational status and race.

Pre-intervention STC-Race. Results from a 2 (college-generational status) x 2 (race) ANOVA on participants' pre-intervention STC-Race scores indicated a main effect of college-generational status, $F(1, 531) = 12.48, p < .001$, a main effect of race, $F(1, 531) = 91.01, p < .001$, and an interaction between college-generational status and race, $F(1, 531) = 6.52, p = .011$.

Planned follow-up tests indicated that FGC-URM students reported more stereotype-threat concern based on their race than the other three groups combined, $t(531) = 8.39, p < .001, d = -1.27$, and more threat than FGC-majority students specifically, $t(531) = 8.90, p < .001, d = -1.29$. As expected, FGC-majority and CGC-majority students did not differ in terms of their stereotype-threat concern based on race, $t(531) = 1.02, p = .308, d = -.11$.

Pre-intervention STC-SES. Results from a 2 (college-generational status) x 2 (race) ANOVA on participants' pre-intervention STC-SES scores indicated a main effect of college-generational status, $F(1, 531) = 37.52, p < .001$, a main effect of race, $F(1, 531) = 40.93, p < .001$, and an interaction between college-generational status and race, $F(1, 531) = 5.39, p = .021$. Planned follow-up tests indicated that FGC-URM students reported more stereotype-threat concern based on their socio-economic backgrounds than the other three groups combined, $t(531) = 7.97, p < .001, d = -1.16$, and more threat than FGC-majority students specifically, $t(531) = 6.42, p < .001, d = -.86$. As expected, FGC-majority students reported more stereotype-threat concern based on their socio-economic backgrounds than CGC-majority students, $t(531) = 3.96, p < .001, d = -.43$.

Pre-intervention STC-CG. Results from a 2 (college-generational status) x 2 (race) ANOVA on participants' pre-intervention STC-CG scores indicated a main effect of college-generational status, $F(1, 531) = 49.62, p < .001$, and a main of race, $F(1, 531) = 25.71, p < .001$, but the interaction between college-generational status and race was not significant, $F(1, 531) = 2.70, p = .101$. Planned follow-up tests indicated that FGC-URM students reported more stereotype-threat concern based on their college-generational status than the other three groups combined, $t(531) = 7.36, p < .001, d = -1.05$, and more threat than FGC-majority students specifically, $t(531) = 4.90, p < .001, d = -.65$. As expected, FGC-majority students reported more

stereotype-threat concern based on their college-generational status than CGC-majority students, $t(531) = 5.62, p < .001, d = -.60$.

Pre-intervention sense of belonging. Results from a 2 (college-generational status) x 2 (race) ANOVA on participants' pre-intervention sense of belonging scores indicated a main effect of race, $F(1, 531) = 6.41, p = .012$, but the college-generational status main effect was not significant, $F(1, 531) = 3.40, p = .066$, nor was the interaction between college-generational status and race, $F(1, 531) = 1.10, p = .296$. Planned follow-up tests indicated that FGC-URM students reported less of a sense of belonging in college compared to the other three groups combined, $t(531) = 2.91, p = .004, d = .42$, and less belonging than FGC-majority students specifically, $t(531) = 2.63, p = .009, d = .36$. However, FGC-majority and CGC-majority did not differ in terms of their sense of belonging in college, $t(531) = 0.83, p = .406, d = .08$.

Summary. Taken together, and consistent with findings from Study 1, results from the pre-intervention survey indicated that FGC students were more concerned than CGC students about confirming negative stereotypes about their social class and race, but that FGC-URM students primarily drove this effect. For every form of stereotype-threat concern, FGC-URM students reported more threat than the combination of the other three groups and more threat than FGC-majority students; FGC-URM students also reported a lower sense of belonging in college than the other three groups combined and less belonging than FGC-majority students specifically. However, FGC-majority students reported comparable levels of stereotype-threat concern based on race, and comparable levels of belonging, to CGC-majority students, but FGC-majority students reported more stereotype-threat concern about their social class (i.e., socio-economic background and college-generational status) compared to CGC-majority students. Thus, while FGC-majority students may be at a slight disadvantage compared to CGC-majority

students because they are contending with negative stereotypes about their social class, FGC-URM students appear to be at a distinct disadvantage because they are contending with social-class and race stereotypes and feel less of a sense of belonging in college.

Data-Analytic Strategy

The impact of the affirmation-training intervention was analyzed using planned comparisons. For each dependent variable the full 2 (college-generational status) x 2 (race) x 3 (intervention condition) ANCOVA was run, and then, using the mean square error (MSE) from the full model, planned comparisons were tested that directly addressed the hypotheses from the current study. For analyses examining the impact of the intervention on full-year GPA, participants' college-entry standardized test scores—obtained from the university registrar—were used as covariates to control for differences in prior achievement; for analyses examining the impact of the intervention on stereotype-threat concern and sense of belonging, participants' pre-intervention scores on each of these variables—taken from the survey completed in lab—were used as covariates to control for baseline line differences.

Gauging psychological process. The primary goal of the current study was to test the impact of an affirmation-training intervention on the FGC students' academic performance. A secondary goal was to shed light on the psychological process through which an affirmation-training intervention might benefit FGC students' performance—potentially by alleviating students' stereotype-threat concern and bolstering students' sense of belonging. Due to concerns about small sample size and statistical power, this study did not gauge process by testing for statistical mediation (e.g., Fritz & MacKinnon, 2007). Rather, the findings on the impact of the affirmation-training intervention on stereotype-threat concern and sense of belonging should be interpreted as an initial first step in establishing a causal chain concerning how affirmation-

training interventions may impact FGC students' academic achievement (see Spencer, Zanna, & Fong, 2005; see also Walton et al., 2015).

Intervention Impact on GPA

Figure 6 shows the means and standard errors for participants' full-year GPAs as a function of intervention condition, and participants' college-generational status and race.

Testing the intervention boost hypotheses. Counter to the *intervention boost* hypothesis, results indicated no difference in full-year GPA between FGC-URM students in the affirmation-training intervention condition and FGC-URM students in the other two conditions combined, $t(414) = 1.12, p = .265, d = .33$. Interestingly, both the affirmation-training intervention and academic-engagement intervention boosted FGC-URM students' academic performance. Specifically, FGC-URM students in the affirmation-training intervention condition received higher full-year GPAs than FGC-URM students in the no-intervention control condition, $t(414) = 2.06, p = .040, d = .68$, which is consistent with hypotheses—but FGC-URM students in the academic-engagement intervention condition also received higher full-year GPAs than FGC-URM students in the no-intervention control condition, $t(414) = 2.09, p = .037, d = .73$. Indeed, FGC-URM students in the two intervention conditions combined received higher full-year GPAs than FGC-URM students in the no-intervention control condition, $t(414) = 2.39, p = .017, d = .69$. No difference in full-year GPAs was observed between FGC-URM students in the affirmation-training intervention condition and FGC-URM students in the academic-engagement intervention condition, $t(414) = 0.13, p = .899, d = -.04$.

Counter to expectations, results indicated that the affirmation-training intervention provided no benefit to FGC-majority students' academic performance—there is actually some evidence that the affirmation-training intervention slightly harmed their performance.

Specifically, no differences in full-year GPAs were observed between FGC-majority students in the affirmation-training intervention condition and FGC-majority students in the other two conditions combined, $t(414) = 1.13, p = .261, d = -.38$, or FGC-majority students in the academic-engagement intervention condition, $t(414) = 1.60, p = .111, d = -.37$. However, FGC-majority students in the affirmation-training intervention received slightly lower full-year GPAs than FGC-majority students in the no-intervention control condition, but this difference did not reach statistical significance $t(414) = 1.76, p = .079, d = -.40$. There was no evidence that the academic-engagement intervention harmed FGC-majority students' performance—no difference in full-year GPAs was observed between FGC-majority students in the academic-engagement intervention condition and FGC-majority students in the no-intervention control condition, $t(414) = 0.18, p = .861, d = -.04$.

Testing the reducing achievement gaps hypothesis. The next set of analyses tested the *reducing achievement gaps* hypothesis—the hypothesis that the affirmation-training intervention would reduce achievement gaps between FGC and CGC students, between FGC-URM students and the other three groups combined, between FGC-URM and FGC-majority students, and between FGC-majority and CGC students.

Counter to expectations, results indicated that both interventions reduced the achievement gap between FGC and CGC students. Specifically, within the no-intervention control condition, a small, non-significant achievement gap emerged between FGC and CGC students—on average, FGC students received lower full-year GPAs than CGC students, $t(414) = 1.75, p = .081, d = .38$. However, no achievement gap emerged within the affirmation-training intervention condition, $t(414) = 0.90, p = .371, d = .31$, nor did it emerge within the academic-engagement intervention condition, $t(414) = 0.04, p = .966, d = .04$.

Again, counter to expectations, results indicated that both interventions eliminated the achievement gap between FGC-URM students and the other three groups combined.

Specifically, within the no-intervention control condition FGC-URM students received lower full-year GPAs than the other three groups combined, $t(414) = 2.22, p = .027, d = .64$; however, this achievement gap did not emerge within the affirmation-training intervention condition, $t(414) = -0.95, p = .342, d = -.24$, but nor did it emerge within the academic-engagement intervention condition, $t(414) = -0.62, p = .539, d = -.19$, which was not hypothesized.

Again, counter to expectations, results indicated that both interventions eliminated the achievement gap between FGC-URM and FGC-majority students. Specifically, within the no-intervention control condition, a slight achievement gap emerged between FGC-URM and FGC-majority students in the hypothesized direction, but it was not significant—specifically, FGC-URM students received lower full-year GPAs compared to FGC-majority students, $t(414) = 1.78, p = .076, d = .51$. However, within the academic-engagement intervention condition, no achievement gap emerged, $t(414) = -0.82, p = .414, d = -.27$, and within the affirmation-training intervention, the achievement gap between FGC-URM and FGC-majority students actually reversed—FGC-URM students received higher full-year GPAs than FGC-majority students, $t(414) = -1.97, p = .049, d = -.61$.

Interestingly, the hypothesized achievement gap did not emerge between FGC-majority students and CGC students—specifically, within the no-intervention control condition, FGC-majority students received comparable full-year GPAs to CGC-URM and CGC-majority students combined, $t(414) = 0.64, p = .522, d = .23$. Similarly, no achievement gap emerged between FGC-majority and CGC students within the academic-engagement intervention condition, $t(414) = 0.55, p = .584, d = .11$. However, counter to expectations, results indicated that the affirmation-

intervention may have harmed FGC-majority students' performance—specifically, within the affirmation-training intervention condition, FGC-majority students received significantly lower full-year GPAs than CGC students, $t(414) = 2.11, p = .035, d = .50$.

Summary. Taken together, results from analyses testing the impact of the affirmation-training intervention on academic achievement provided mixed support for hypotheses. It was expected that the affirmation-training intervention would boost the achievement of both FGC-URM and FGC-majority students, but results indicated that the affirmation-training intervention only benefitted FGC-URM students—the affirmation-training intervention boosted FGC-URM students GPAs compared to the no-intervention control condition and eliminated the achievement gaps between FGC-URM and the other groups that was present in the no-intervention control condition.

On the other hand, results indicated that the affirmation-training intervention either had no impact on FGC-majority students' academic performance or may have slightly harmed their performance—the affirmation-training intervention lead to a small reduction in FGC-majority students' academic performance compared to those in the no-intervention control condition and an achievement gap emerged between FGC-majority and CGC students in affirmation-training intervention condition that was not present in the no-intervention control condition.

Interestingly, and counter to hypotheses, results indicated that the academic-engagement condition also boosted the academic achievement of FGC-URM students. The academic-engagement intervention significantly boost FGC-URM students full-year GPAs compared to the no-intervention control condition and eliminated the achievement gap between FGC-URM students and the other students.

Intervention Impact on Threat and Belonging

The next set of analyses aimed to shed light on the process by which an affirmation-training intervention might reduce social class achievement gaps. It was hypothesized that the affirmation-training intervention would benefit FGC students' academic performance by reducing their concern about being negatively stereotyped based on their social class and race, and bolster their sense of belonging in college (Cook et al., 2012). Specifically, it was hypothesized that the affirmation-training intervention would reduce both FGC-URM and FGC-majority students' stereotype-threat concerns about their social class (i.e., socio-economic background and college-generational status) and boost their sense of belonging, and that the affirmation-training intervention would also reduce FGC-URM students' stereotype-threat concern about their race.

Post-intervention STC-Race. Figure 7 displays the means and standard errors for participants' post-intervention STC-Race scores as a function of their college-generational status and race, controlling for pre-intervention STC-Race scores. Consistent with hypotheses, results indicated that the affirmation-training intervention reduced FGC-URM students' concern about being negatively stereotyped as a function of their race. Specifically, FGC-URM students in the affirmation-training intervention condition reported significantly lower stereotype-threat concern based on their race compared to FGC-URM students in the other two intervention conditions combined, $t(277) = 3.29, p = .001, d = -1.10$, compared to FGC-URM students in the academic-engagement condition specifically, $t(277) = 3.20, p = .002, d = -1.28$, and compared to FGC-URM students in the no-intervention control condition specifically, $t(277) = 2.29, p = .023, d = -.96$. As expected, no difference in stereotype-threat concern based on race was observed

between FGC-URM students in the academic-engagement intervention condition and FGC-URM students in the no-intervention control condition, $t(277) = 0.82, p = .414, d = .38$.

The affirmation-training intervention was not expected to impact FGC-majority students' stereotype-threat concern based on race. Consistent with this expectation, FGC-majority students' race-based stereotype-threat concern did not vary by intervention condition, all $ts < 1$.

Post-intervention STC-SES and STC-CG. Figures 8 and 9 display the means and standard errors for participants' post-intervention STC-SES and STC-CG scores as a function of their college-generational status and race, controlling for pre-intervention STC-SES and STC-CG scores, respectively. Consistent with hypotheses, results indicated that the affirmation-training intervention reduced FGC-URM students' concern about confirming negative stereotypes based on their socio-economic background and college-generational status. Specifically, FGC-URM students in the affirmation-training intervention condition reported less stereotype-threat concern based on socio-economic background, $t(278) = -2.22, p = .027, d = -.77$, and college-generational status, $t(277) = -2.20, p = .029, d = -.77$, compared to the FGC-URM students in the other two conditions combined. Similarly, FGC-URM students in the affirmation-training intervention condition reported less stereotype-threat concern based on socio-economic background, $t(278) = -2.15, p = .033, d = -.91$, and college-generational status, $t(277) = -2.27, p = .024, d = -.97$, compared to FGC-URM students in the no-intervention control condition. However, inconsistent with expectations, the difference in stereotype-threat concern based on socio-economic background, $t(278) = -1.56, p = .121, d = -.64$, or college-generational status, $t(277) = -1.42, p = .158, d = -.59$, did not significantly differ between FGC-URM students in the affirmation-training intervention condition and FGC-URM students in the academic-engagement intervention condition. As expected, there was no difference in stereotype-threat

concern based on socio-economic background, $t(278) = -0.52, p = .603, d = -.23$, or college-generational status, $t(277) = 0.78, p = .435, d = -.37$, between FGC-URM students in the academic-engagement condition and FGC-URM students in the no-intervention control condition.

It was hypothesized that the affirmation-training intervention would also reduce stereotype-threat concern based on socio-economic background and college-generational status for FGC-majority students, but results did not support this hypothesis. FGC-majority students' concern about confirming negative stereotypes about their socio-economic background and college-generational status did not vary by intervention condition, all t s < 1.63 .

Post-intervention sense of belonging. Figure 10 displays the means and standard errors for participants' post-intervention sense of belonging scores as a function of their college-generational status and race, controlling for pre-intervention sense of belonging scores. Overall, the affirmation-training intervention may have provided FGC-URM students with a slight boost in their sense of belonging college—which was consistent with hypotheses—however this boost was generally non-significant. FGC-URM students in the affirmation-training intervention condition reported a slightly higher sense of belonging college compared to FGC-URM students in the other two conditions combined, but this difference did not reach statistical significance, $t(277) = 1.79, p = .075, d = .62$. However, when comparing sense of belonging between FGC-URM students in the affirmation-training intervention condition and the other two conditions individually, neither difference is significant, but they are in the expected direction—academic-engagement intervention condition: $t(277) = 1.47, p = .144, d = .62$; no-intervention control condition: $t(277) = 1.53, p = .127, d = .64$. Consistent with expectations, no difference in sense of belonging was observed between FGC-URM students in the academic-engagement

intervention condition and FGC-URM students in the no-intervention control condition, $t(277) = 0.06, p = .952, d = .03$.

It was also hypothesized that the affirmation-training intervention would bolster FGC-majority students' sense of belonging in college—results indicate that this hypothesis was supported. Specifically, FGC-majority students in the affirmation-training intervention reported significantly higher sense of belonging compared to FGC-majority students in the other two intervention conditions combined, $t(277) = 2.64, p = .009, d = .62$, compared to FGC-majority students in the academic-engagement intervention condition specifically, $t(277) = 2.39, p = .018, d = .66$, and compared to FGC-majority students in the no-intervention control condition, $t(277) = 2.07, p = .039, d = .57$. Also, consistent with hypotheses, no difference in sense of belonging was observed between FGC-majority students in the academic-engagement intervention condition and FGC-majority students in the no-intervention control condition, $t(277) = -0.32, p = .750, d = -.09$.

Discussion

The goal of Study 2 was to investigate the extent to which an affirmation-training intervention could reduce the achievement gap between FGC and CGC students by allaying concerns about stereotype threat and bolstering a sense of belonging in college. Based on the multiple minority hypothesis it was expected that the intervention would be particularly effective for FGC-URM students. Findings from Study 2 indicate that affirmation-training interventions may be effective in reducing achievement gaps between FGC and CGC students, particularly for FGC-URM students. However, it is unclear why the academic-engagement intervention was as effective as the affirmation-training intervention in boosting FGC-URM students' GPAs and reducing achievement gaps between FGC-URM students and the other groups of students.

Findings suggest that, although both the affirmation-training and academic-engagement interventions were effective in boosting FGC-URM students' grades, they may have targeted different mechanisms. The affirmation-training intervention, but not the academic-engagement intervention, reduced FGC-URM students' concerns about confirming negative stereotypes about their social class and race. Future research should explore the mechanism through which the academic-engagement intervention may benefit FGC-URM students' academic achievement.

Chapter 8

GENERAL DISCUSSION

Decades of research have found that FGC students underachieve in college compared to CGC students. Past research aimed at understanding the contributing factors to FGC students' underachievement have primarily focused on their academic preparedness for college, their access to social and economic resources both before and during college, and, more recently, the extent to which FGC students may be unaccustomed to the cultural norms and expectations on American college campuses. The current research contributed two studies that investigated the extent to which social identity threat—the fear of being devalued and judged based on membership in underrepresented, negatively stereotyped social groups—could be contributing to FGC students' underachievement in college (Steele et al., 2002), and whether a brief social-psychological intervention could effectively reduce the achievement gap between FGC and CGC students (Yeager & Walton, 2011). Results from studies 1 and 2 indicated that, in general, FGC-URM students reported more concern about confirming negative group stereotypes—based on race and social class—compared to FGC-majority and CGC students. Results from Study 2 indicated that two different brief social-psychological interventions eliminated the college-generational status achievement gap for FGC-URM students, but one of the interventions harmed the achievement of FGC-majority students. These findings highlight the importance of considering students' multiple, intersecting social identities when investigating how identity threat could be contributing to disadvantaged students' underachievement, but also, the importance of ensuring that brief interventions—that may tap into self-reinforcing recursive processes—do not inadvertently harm the students' performance, particularly the students that the interventions are attempting to help. Together, the findings from the current research suggest

that social identity threat should be considered as a contributing factor to the college-generational status achievement gap, and that brief social-psychological interventions can reduce the achievement gap between FGC and CGC students, but that more research is needed before these brief interventions can be employed on a large scale in real-world settings.

How Might Social Identity Threat Contribute to FGC Students' Underachievement?

For decades, research has found that FGC students underachieve compared to CGC students. Many of the current explanations for this achievement gap ignore the potential role that social identity threat—such as concern about confirming negative group stereotypes—could be playing in contributing to FGC students' underachievement (Walton & Cohen, 2007; cf. Stephens et al., 2014). This is despite the fact that FGC students are more likely than CGC students to be URM and come from low socio-economic backgrounds, and that a copious amount of research has documented the harmful effects of stereotype threat for college students who are URM (e.g., Schmader & Johns, 2003; Steele & Aronson, 1995) and college students from low socio-economic backgrounds and (e.g., Croizet & Claire, 1998; John-Henderson et al., 2014). One of the goals of the current research was to gauge the extent to which FGC students are contending with social identity threat as a function of both their race and social class.

Consistent with hypotheses, FGC students, in general, reported more stereotype-threat concern than CGC students; however, these effects were largely driven by the stereotype-threat concern reported by FGC-URM students. Specifically, as expected, FGC-URM students reported more stereotype-threat concern based on race than FGC-majority students (studies 1 and 2). Counter to expectations though, compared to FGC-majority students, FGC-URM students also reported more stereotype-threat concern based on their social class—socio-economic background (studies 1 and 2) and college-generational status (Study 2). These findings highlight the

importance of taking an intersectional approach to understanding social identity threat. Rather than assume that the amount of threat linearly increases as the number of stereotyped identities increases (cf. Tine & Gotlieb, 2013), these findings suggest that the social identity threat based on one identity may sensitize people to the experience of social identity threat for a different identity (see Gonzales et al., 2002 for similar reasoning). Thus, even though FGC-URM and FGC-majority students may have similar SES (Hollingshead, 1975), the identity threat that FGC-URM students experience based on their social class may be distinct—and more harmful—from the identity threat that FGC-majority students experience based on their social class (Bullock, 1995). Although these findings support the hypothesis that FGC students—particularly FGC-URM students—may be vulnerable to social identity threat, the results from Study 1 did not find any evidence to suggest that differences in stereotype-threat concern accounted for differences in academic achievement between FGC and CGC students.

Social identity threat, belonging, and cultural mismatch. Another goal of the current research was to examine how social identity threat—which includes students' sense of belonging in college (Walton & Cohen, 2007)—related to cultural mismatch (Stephens et al., 2012a). Previous studies have found mixed support for the assumption that cultural mismatch would be related to a lower sense of belonging college (e.g., Tibbetts et al., 2016; Harackiewicz et al., 2016; cf. Stephens et al., 2012a). No studies had yet examined whether stereotype-threat concern would be related cultural mismatch. As expected, more stereotype-threat concern—based on both social class and race—was related to a lower sense of belonging in college. Interestingly, more stereotype-threat concern—particularly based on race—was related to more interdependent motives for attending college, but stereotype-threat concerns were unrelated to independent motives for attending college. And, consistent with recent research (Tibbetts et al., 2016) but

inconsistent with cultural mismatch theory (Stephens et al., 2012a), sense of belonging in college was not correlated with interdependent or independent motives for attending college.

Brief Social-Psychological Interventions and FGC Students' Academic achievement

Study 1 provided initial evidence that FGC students—particularly FGC-URM students—may be vulnerable to social identity threat. Study 2 tested whether a brief affirmation intervention could protect FGC students' academic achievement by alleviating stereotype-threat concern. Specifically, Study 2 aimed to make a number of contributions to the literature on values-affirmation interventions. First, this study was the first test of an affirmation-training intervention for FGC students—previously, this specific intervention had only been tested with female college students in engineering (Walton et al., 2015). Second, this study was the first to test the extent to which values-affirmation interventions may be effective by reducing underrepresented students' concerns about being negatively stereotyped based on multiple different social identities—past studies have examined the extent to which values-affirmation interventions boost negatively stereotyped students' sense of belonging (Cook et al., 2012) and their general attitudes toward a particular academic domain (Harackiewicz et al., 2014; Walton et al., 2015), but the current study is the first to directly test the extent to which values-affirmation interventions may benefit negatively stereotyped students' academic performance by reducing their concern about being negatively stereotyped. Finally, this study aimed to provide some clarification about whether or not values-affirmation interventions should be considered a viable strategy for combating the achievement gap between FGC and CGC students. The past evidence for their effectiveness with FGC students (Harackiewicz et al., 2016; Tibbetts et al., 2016) was mixed.

Affirmation-training intervention. It was hypothesized that the affirmation-training intervention—by combating students’ stereotype-threat concern and bolstering their sense of belonging in college—would reduce or eliminate the achievement gap between FGC and CGC students (Cook et al., 2012; Harackiewicz et al., 2014; Walton et al., 2015; cf. Harackiewicz et al., 2016), and that this effect would be most pronounced for FGC-URM students who may be more vulnerable to social identity threat than FGC-majority students (Gonzales et al., 2002; Shih et al., 1999). Counter to expectations, the affirmation-training intervention only benefitted FGC-URM students’ academic achievement (it harmed FGC-majority students’ achievement; see below). Specifically, in the no-intervention control condition an achievement gap emerged between FGC-URM students and the other students (FGC-majority and CGC students), but in the affirmation-training intervention condition, this achievement gap was eliminated. Findings examining the impact of the interventions on students’ stereotype-threat concern and sense of belonging in college indicated that the affirmation-training intervention may have benefitted FGC-URM students’ achievement by alleviating their concern about confirming negative group stereotypes about their social class, and particularly, their race—the affirmation-training intervention did not affect FGC-URM students’ sense of belonging in college (cf. Cook et al., 2012, Schnabel et al., 2013).

Academic-engagement intervention. Counter to hypotheses, the academic-engagement intervention also boosted FGC-URM students’ grades, and eliminated the achievement gap between FGC-URM and CGC students. Unlike the affirmation-training intervention, however, the academic-engagement intervention did not affect FGC-URM students’ stereotype-threat concern (or sense of belonging)—suggesting that the two interventions may have targeted different psychological mechanisms. Based on the findings from a previous study that used a

similar comparison condition (Walton et al., 2015), it was hypothesized that the academic-engagement intervention would not benefit FGC students' achievement, because it did not specifically combat the psychological experience of social identity threat (cf. Good, Aronson, & Inzlicht, 2003). However, counter to this reasoning, it is possible that both interventions benefitted FGC-URM students' academic achievement, because both interventions encouraged reattributing academic difficulties from something that is internal (e.g., "I am struggling in college, because I am not smart enough—no one else seems to be struggling") to something that is external (e.g., "I am struggling in college, because college is hard—other people are struggling too"; cf. Walton & Cohen, 2007, 2011). This is the precise goal of a social-psychological intervention known as, attributional retraining (Wilson & Linville, 1982, 1985; see also Steele, 1997), which has been found to protect the achievement of college students' from a variety of different social groups (Wilson et al., 2002), as well as students vulnerable to stereotype threat (Good et al., 2003). In essence, both interventions encouraged attributional retraining by highlighting the fact that students at their school were able to overcome initial academic struggles. In this same vein, it is also possible that by reminding students that they can overcome academic obstacles with effort that both interventions encouraged FGC-URM students to embrace a growth mindset (Dweck, 1999), which has been found to effectively combat stereotype-threat underperformance (Blackwell, Trzesniewski, & Dweck, 2007). Taken together, the findings from the current research indicated that the academic-engagement intervention was more successful than the affirmation-training intervention, because the academic-engagement intervention either produced either positive or null effects, but no harmful effects—the same cannot be said about the affirmation-training intervention.

Boomerang effects and affirmation-training interventions. Unexpectedly, findings from the current research indicated that the affirmation-training intervention harmed FGC-majority students' academic performance. Although no achievement gap was found between FGC-majority students and CGC students, within the affirmation-training condition, this achievement gap did emerge. These findings suggest that the affirmation-training intervention may have caused a boomerang effect—this intervention produced an effect that was opposite of the intended effect (Byrne & Hart, 2009). Interestingly, the only other study to test an affirmation-training intervention also found evidence of a boomerang effect (Walton et al., 2015, supplemental material). Recall that Walton and colleagues found that an affirmation-training intervention benefitted the academic achievement of female engineering students who were in male-dominated programs; however, for female engineering students in gender-diverse majors, those who received an affirmation-training intervention earned lower grades than those in a no-intervention control condition. It is unclear what may have caused the boomerang effect in the current research. Past work on psychological reactance—which is conceptually similar to a boomerang effect—suggests that interventions may fail when they threaten students' sense of autonomy (Elmore, Oyserman, Smith, and Novin, 2016). Thus, it is possible that the affirmation-training intervention threatened FGC-majority students' sense of autonomy, which prevented them from assimilating the message of the intervention.

False sense of comfort for FGC-majority students? Interestingly, in addition to harming FGC-majority students' achievement, findings indicated that the affirmation-training intervention also increased their sense of belonging in college. It was hypothesized that the affirmation-training intervention would boost FGC-majority students' sense of belonging in college, but this boost in belonging should have accompanied by a boost in achievement—not a

drop in achievement. Nelum-Hart, Schooler, Wilson, and Meyers (1999; as cited in Wilson et al., 2002) found a similarly counterintuitive effect in a study that tested the effectiveness of an attributional retraining intervention. Specifically, similar to the current study, Nelum-Hart and colleagues found that an attributional retraining intervention produced a boomerang effect for African American college students, but only for African American college students who reported low levels of worrying. Together, these findings suggest that the affirmation-training intervention may have boosted FGC-majority students' sense of belonging in college, which then caused them to become less worried about their academic performance. Admittedly, this is only speculation. Future research should investigate the psychological mechanism underlying why affirmation-training interventions may be prone to producing boomerang effects.

Limitations and Future Directions

Small sample sizes. The primary limitation of the current research pertains to the small sample sizes in both studies, particularly with regard to URM students. The most intriguing findings from the current research focused on the FGC-URM students—for example, findings suggest FGC-URM students may be more vulnerable to social identity threat than FGC-majority, and that brief social-psychological interventions may be able to protect FGC-URM students from underperformance. However, because both studies had relatively few FGC-URM students—and thus, low statistical power—these findings should be interpreted with some caution (Button et al., 2013). Small sample sizes and low statistical power are common in the psychological literature (Szucs & Ioannidis, 2017), which may be contributing to the current replication crisis in psychology (Open Science Collaboration, 2015). Indeed, the only other study to test an affirmation-training intervention also had a small sample size, particularly for participants in the primary social group under investigation (a total of 28 female engineering students in male-

dominated majors, distributed across three conditions, provided researchers with consent to access their grade data; Walton et al., 2015, supplemental material). Thus, the only two studies that have tested affirmation-training interventions have suffered from relatively small sample sizes, and both studies have found evidence for boomerang effects (Byrne & Hart, 2009). After conducting a sufficient amount of preliminary research to guard against the possibility of more boomerang effects, future research should test the efficacy of affirmation-training interventions—and academic-engagement interventions—to protect the academic performance of FGC students, and other disadvantaged students, on a larger scale (Yeager & Walton, 2011).

Measurement of stereotype-threat concern. One potential limitation of the current research pertains to how stereotype-threat concern was conceptualized and measured. This limitation can be broken down into two parts. First, the current research attempted to measure stereotype-threat concern. This assumes that people are consciously aware of stereotype threat and that they are able to accurately report their experience of it (cf. Nisbett & Wilson, 1977). In general, there is mixed evidence concerning whether people can self-report their stereotype-threat experience (see Spencer et al., 2016). Second, the scales that were used to measure stereotype-threat concern in the current research were adapted from past research (Marx & Goff, 2005), but they have never been psychometrically validated. Thus, the stereotype-threat concern findings from the current research should be interpreted with some caution. With that said, the current research extended previous work by attempting to measure stereotype-threat concern as a function of multiple negatively stereotyped social identities at once. Future research should aim to develop a psychometrically valid measure of stereotype-threat concern that can be adapted to accommodate a variety of different social identities (cf. Picho & Brown, 2011).

Conclusion

Gaining admission to college and obtaining a degree is one path for people wanting to achieve social mobility in America. For higher education to be considered a viable path to social mobility, however, it requires the success and achievement of FGC students. Decades of research have found that, compared to their peers, FGC students struggle once they get to college—earning lower grades and dropping out at higher rates. The current research provided initial evidence that FGC students may be underachieving in college due to the fear of confirming intersecting societal stereotypes about social class and race. The current research also provided initial evidence that brief social-psychological interventions that frame academic struggles as something that all students experience, and that can be overcome, may be particularly effective for protecting the academic achievement of FGC-URM students. Together, these findings suggest that efforts to eliminate the achievement gap between FGC and CGC students should consider strategies for alleviating FGC students' potential concerns about confirming societal stereotypes so these students are able to achieve up to their true potential.

References

- Alger, H., Jr. (1868/2014). *Ragged dick: Or, street life in New York with the boot blacks*. New York, NY: Penguin Group.
- Autor, D. H. (2014). Skills, education, and the rise of earnings inequality among the ‘other 99 percent.’ *Science*, 344, 843–851. DOI: 10.1126/science.1251868
- Billson, J., and Terry, B. (1982). In search of the silken purse: Factors in attrition among first-generation students. *College and University* 58, 57–75. Retrieved from <https://eric.ed.gov/?id=ED214431>
- Blackwell, L. S., Trzesniewski, K. H., & Dweck, C. S. (2007). Implicit theories of intelligence predict achievement across an adolescent transition: A longitudinal study and an intervention. *Child Development*, 78, 246–263. DOI: 10.1111/j.1467-8624.2007.00995.x
- Bowen, W. G., Kurzweil, M. A., & Tobin, E. M. (2005). *Equity and excellence in American higher education*. Charlottesville: University of Virginia Press.
- Bullock, H. E. (1995). Class acts: Middle-class responses to the poor. In B. Lott & D. Maluso (Eds.), *The social psychology of interpersonal discrimination* (pp. 118-159). New York, NY: Guilford Press.
- Brown, R. P., & Day, E. A. (2006). The difference isn't black and white: Stereotype threat and the race gap on raven's advanced progressive matrices. *Journal of Applied Psychology*, 91, 979–985. DOI: 10.1037/0021-9010.91.4.979
- Bryan, C. J., Walton, G. M., & Dweck, C. S. (2016). Psychologically authentic versus inauthentic replication attempts. *Proceedings of the National Academy of Sciences of the United States of America*, 113, E6548. DOI: 10.1073/pnas.1609625113

- Button, K. S., Ioannidis, J. P., Mokrysz, C., Nosek, B. A., Flint, J., Robinson, E. S., & Munafò, M. R. (2013). Power failure: Why small sample size undermines the reliability of neuroscience. *Nature Reviews Neuroscience*, *14*, 365–376.
- Byrne, S., & Hart, P. S. (2009). The boomerang effect: A synthesis of findings and a preliminary theoretical framework. *Annals of the International Communication Association*, *33*, 3–37. DOI: 10.1080/23808985.2009.11679083
- Cohen, G. L., Garcia, J., Apfel, N., & Master, A. (2006). Reducing the racial achievement gap: A social-psychological intervention, *Science*, *313*, 1307–1310. DOI: 10.1126/science.1128317
- Cohen, G. L., Garcia, J., Purdie-Vaughns, V., Apfel, N., & Brzustoski, P. (2009). Recursive processes in self-affirmation: Intervening to close the minority achievement gap. *Science*, *324*, 400–403. DOI: 10.1126/science.1170769
- Cohen G. L., Purdie-Vaughns V., & Garcia J., (2012). An identity threat perspective on intervention. In M. Inzlicht & T. Schmader (Eds.), *Stereotype threat: Theory, process, and application* (pp. 280–96). New York, NY USA: Oxford University Press
- Cohen, G. L., & Sherman, D. K. (2014). The psychology of change: Self-affirmation and social psychological intervention. *Annual Review of Psychology*, *65*, 333–371. DOI: 10.1146/annurev-psych-010213-115137
- Cook, J. E., Purdie-Vaughns, V., Garcia, J., & Cohen, G. L. (2012). Chronic threat and contingent belonging: Protective benefits of values affirmation on identity development. *Journal of Personality and Social Psychology*, *102*, 479–496. DOI: 10.1037/a0026312

- Covarrubias, R., Herrmann, S. D., & Fryberg, S. A. (2016). Affirming the interdependent self: Implications for Latino student performance. *Basic and Applied Social Psychology*, 38, 47–57. DOI: 10.1080/01973533.2015.1129609
- Cozzarelli, C., Wilkinson, A. V., & Tagler, M. J. (2001). Attitudes toward the poor and attributions for poverty. *Journal of Social Issues*, 57, 207–227. DOI: 10.1111/0022-4537.00209
- Cheryan, S., Plaut, V. C., Davies, P. G., & Steele, C. M. (2009). Ambient belonging: How stereotypical cues impact gender participation in computer science. *Journal of Personality and Social Psychology*, 97, 1045–1060. DOI: 10.1037/a0016239
- Christopher, A. N., & Schlenker, B. R. (2000). The impact of perceived material wealth and perceiver personality on first impressions. *Journal of Economic Psychology*, 21, 1–19. DOI: 10.1016/S0167-4870(99)00033-1
- Corcoran, M. (1995). From rags to rags: Poverty and mobility in the United States. *Annual Review of Sociology*, 21, 237–267. DOI: 10.1146/annurev.so.21.080195.001321
- Croizet, J., & Claire, T. (1998). Extending the concept of stereotype threat to social class: The intellectual underperformance of students from low socioeconomic backgrounds. *Personality and Social Psychology Bulletin*, 24, 588–594. DOI: 10.1177/0146167298246003
- Devine, P. G., & Elliot, A. J. (1995). Are racial stereotypes really fading? The Princeton trilogy revisited. *Personality and Social Psychology Bulletin*, 21, 1139–1150. DOI: 10.1177/01461672952111002
- Dweck, C. (1999). *Self-theories: Their role in motivation, personality, and development*. Philadelphia, PA: Psychology Press.

- Elmore, K., Oyserman, D., Smith, G., & Novin, S. (2016). When the going gets tough: Implications of reactance for interpretations of experienced difficulty in the classroom. *AERA Open*, 2, 1–11. DOI: 10.1177/2332858416664714
- Fritz, M. S., & MacKinnon, D. P. (2007). Required sample size to detect the mediated effect. *Psychological Science*, 18, 233–239. DOI: 10.1111/j.1467-9280.2007.01882.x
- Fryberg, S. A., & Markus, H. R. (2007). Cultural models of education in American Indian, Asian American, and European American contexts. *Social Psychology of Education*, 10, 213–246. DOI: 10.1007/s11218-007-9017-z
- Gofen, A. (2009). Family capital: How first-generation higher education students break the intergenerational cycle. *Family Relations*, 58, 104–120. DOI: 10.1111/j.1741-3729.2008.00538.x
- Goffman, E. (1963/1986). *Stigma: Notes on the management of spoiled identity*. New York, NY USA: Simon & Schuster Inc.
- Gonzales, P. M., Blanton, H., & Williams, K. J. (2002). The effects of stereotype threat and double-minority status on the test performance of Latino women. *Personality and Social Psychology Bulletin*, 28, 659–670. DOI: 10.1177/0146167202288010
- Good, C., Aronson, J., & Inzlicht, M. (2003). Improving adolescents' standardized test performance: An intervention to reduce the effects of stereotype threat. *Journal of Applied Developmental Psychology*, 24, 645–662. DOI: 10.1016/j.appdev.2003.09.002
- Hanselman, P., Rozek, C. R., Grigg, J., & Borman, G. D. (2016). New evidence on self-affirmation effects and theorized sources of heterogeneity from large-scale replications. *Journal of Educational Psychology*. Advance online publication. DOI: 10.1037/edu0000141

- Harackiewicz, J. M., Canning, E. A., Tibbetts, Y., Giffen, C. J., Blair, S. S., Rouse, D. I., & Hyde, J. S. (2014). Closing the social class achievement gap for first-generation students in undergraduate biology. *Journal of Educational Psychology*, *106*, 375–389. DOI: 10.1037/a0034679
- Harackiewicz, J. M., Canning, E. A., Tibbetts, Y., Priniski, S. J., & Hyde, J. S. (2016). Closing achievement gaps with a utility-value intervention: Disentangling race and social class. *Journal of Personality and Social Psychology*, *111*, 745–765. DOI: 10.1037/pspp0000075
- Harrison, L. A., Stevens, C. M., Monty, A. N., & Coakley, C. A. (2006). The consequences of stereotype threat on the academic performance of White and non-White lower income college students. *Social Psychology of Education*, *9*, 341–357. DOI: 10.1007/s11218-005-5456-6
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY: Guilford Press.
- Hollingshead, A. B. (1975). *Four factor index of social status*. Unpublished manuscript, Department of Sociology, Yale University, New Haven, CT, USA.
- Ishitani, T. T. (2006). Studying attrition and degree completion behavior among first-generation college students in the United States. *Journal of Higher Education*, *77*, 861–885. DOI: 10.1080/00221546.2006.11778947
- Johannesen-Schmidt, M. C., & Eagly, A. H. (2002). Diminishing returns: The effects of income on the content of stereotypes of wage earners. *Personality and Social Psychology Bulletin*, *28*, 1538–1545. DOI: 10.1177/014616702237581

- John-Henderson, N. A., Rheinschmidt, M. L., Mendoza-Denton, R., & Francis, D. D. (2014). Performance and inflammation outcomes are predicted by different facets of SES under stereotype threat. *Social Psychological and Personality Science*, 5, 301–309. DOI: 10.1177/1948550613494226
- Kraus, M. W., & Tan, J. J. (2015). Americans overestimate social class mobility. *Journal of Experimental Social Psychology*, 58, 101–111. DOI: 10.1016/j.jesp.2015.01.005
- Leyens, J. P., Désert, M., Croizet, J. C., & Darcis, C. (2000). Stereotype threat: Are lower status and history of stigmatization preconditions of stereotype threat? *Personality and Social Psychology Bulletin*, 26, 1189–1199. DOI: 10.1177/0146167200262002
- Martens, A., Johns, M., Greenberg, J., & Schimel, J. (2006). Combating stereotype threat: The effect of self-affirmation on women's intellectual performance. *Journal of Experimental Social Psychology*, 42, 236–243. DOI: 10.1016/j.jesp.2005.04.010
- Marx, D. M., & Goff, P. A. (2005). Clearing the air: The effect of experimenter race on target's test performance and subjective experience. *British Journal of Social Psychology*, 44, 645–657. DOI: 10.1348/014466604X17948
- McGlone, M. S., & Aronson, J. (2006). Stereotype threat, identity salience, and spatial reasoning. *Journal of Applied Developmental Psychology*, 27, 486–493. DOI: 10.1016/j.appdev.2006.06.003
- Miyake, A., Kost-Smith, L., Finkelstein, N. D., Pollock, S. J., Cohen, G. L., & Ito, T. A. (2010). Reducing the gender achievement gap in college science: A classroom study of values affirmation. *Science*, 330, 1234–1237. DOI: 10.1126/science.1195996

- Moschetti, R., & Hudley, C. (2008). Measuring social capital among first-generation and non-first-generation, working-class, white males. *Journal of College Admission*, 198, 25–30. Retrieved from <https://eric.ed.gov/?id=EJ829418>
- Murphy, M. C., Steele, C. M., & Gross, J. J. (2007). Signaling threat: How situational cues affect women in math, science, and engineering settings. *Psychological Science*, 18, 879–885. DOI: 10.1111/j.1467-9280.2007.01995.x
- Niemann, Y. F. (2001). Stereotypes about Chicanas and Chicanos implications for counseling. *The Counseling Psychologist*, 29, 55–90. DOI: 10.1177/0011000001291003
- Nisbett, R. E., & Wilson, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, 84, 231–259. DOI: 10.1037/0033-295X.84.3.231
- Nunez, A. & Cuccaro-Alamin, S. (1998). *First-generation students: Undergraduates whose parents never enrolled in postsecondary education*. Washington, DC: National Center for Education Statistics. Retrieved from <http://files.eric.ed.gov/fulltext/ED420235.pdf>
- Open Science Collaboration (2015). Estimating the reproducibility of psychological science. *Science*, 349 (6251), aac4716. DOI: 10.1126/science.aac4716
- Ostrove, J. M., & Long, S. M. (2007). Social class and belonging: Implications for college adjustment. *The Review of Higher Education*, 30, 363–389. DOI: 10.1353/rhe.2007.0028
- Pascarella, E., Pierson, C., Wolniak, G., & Terenzini, P. (2004). First-generation college students: Additional evidence on college experiences and outcomes. *Journal of Higher Education*, 75, 249–284. DOI: 10.1353/jhe.2004.0016

- Peugh, J. L., & Enders, C. K. (2005). Using the SPSS mixed procedure to fit cross-sectional and longitudinal multilevel models. *Educational and Psychological Measurement*, 65, 717–741. DOI: 10.1177/0013164405278558
- Picho, K., & Brown, S. W. (2011). Can stereotype threat be measured? A validation of the Social Identities and Attitudes Scale (SIAS). *Journal of Advanced Academics*, 22, 374–411. DOI: 10.1177/1932202X1102200302
- Protzko, J., & Aronson, J. (2016). Context moderates affirmation effects on the ethnic achievement gap. *Social Psychological and Personality Science*, 7, 500–507. DOI: 10.1177/1948550616646426
- Purdie-Vaughns, V., Steele, C. M., Davies, P. G., Dittmann, R., & Crosby, J. R. (2008). Social identity contingencies: How diversity cues signal threat or safety for African Americans in mainstream institutions. *Journal of Personality and Social Psychology*, 94, 615–630. DOI: 10.1037/0022-3514.94.4.615
- Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods*. Thousand Oaks, CA: Sage Publications.
- Rheinschmidt, M. L., & Mendoza-Denton, R. (2014). Social class and academic achievement in college: The interplay of rejection sensitivity and entity beliefs. *Journal of Personality and Social Psychology*, 107, 101–121. DOI: 10.1037/a0036553
- Riehl, R. J. (1994). The academic preparation, aspirations, and first-year performance of first-generation students. *College and University*, 70, 14–19. Retrieved from <https://eric.ed.gov/?id=EJ499539>

- Rodríguez, B. A. (2014). The threat of living up to expectations: Analyzing the performance of Hispanic students on standardized exams. *Journal of Hispanic Higher Education*, 13, 191–205. DOI: 10.1177/1538192714531292
- Rydell, R. J., McConnell, A. R., & Beilock, S. L. (2009). Multiple social identities and stereotype threat: Imbalance, accessibility, and working memory. *Journal of Personality and Social Psychology*, 96, 949–966. DOI: 10.1037/a0014846
- Saenz, V. B., Hurtado, S., Barrera, D., Wolf, D., & Yeung, F. (2007). *First in my family: A profile of first-generation college students at four-year institutions since 1971*. Los Angeles, CA: Higher Education Research Institute. Retrieved from <https://www.heri.ucla.edu/PDFs/pubs/TFS/Special/Monographs/FirstInMyFamily.pdf>
- Schmader, T., & Johns, M. (2003). Converging evidence that stereotype threat reduces working memory capacity. *Journal of Personality and Social Psychology*, 85, 440–452. DOI: 10.1037/0022-3514.85.3.440
- Schmader, T., Johns, M., & Forbes, C. (2008). An integrated process model of stereotype threat effects on performance. *Psychological Review*, 115, 336–356. DOI: 10.1037/0033-295X.115.2.336
- Sherman, D. K., Hartson, K. A., Binning, K. R., Purdie-Vaughns, V., Garcia, J., Taborsky-Barba, S., . . . Cohen, G. L. (2013). Deflecting the trajectory and changing the narrative: How self-affirmation affects academic performance and motivation under identity threat. *Journal of Personality and Social Psychology*, 104, 591–618. DOI: 10.1037/a0031495
- Shih, M., Pittinsky, T. L., & Ambady, N. (1999). Stereotype susceptibility: Identity salience and shifts in quantitative performance. *Psychological Science*, 10, 80–83. DOI: 10.1111/1467-9280.00111

- Shnabel, N., Purdie-Vaughns, V., Cook, J. E., Garcia, J., & Cohen, G. L. (2013). Demystifying values-affirmation interventions: Writing about social belonging is a key to buffering against identity threat. *Personality and Social Psychology Bulletin*, 39, 663–676. DOI: 10.1177/0146167213480816
- Soria, K. M., & Stebleton, M. J. (2012). First-generation students' academic engagement and retention. *Teaching in Higher Education*, 17, 673–685. DOI: 10.1080/13562517.2012.666735
- Spencer, B., & Castano, E. (2007). Social class is dead. Long live social class! Stereotype threat among low socioeconomic status individuals. *Social Justice Research*, 20, 418–432. DOI: 10.1007/s11211-007-0047-7
- Spencer, S. J., Logel, C., & Davies, P. G. (2016). Stereotype threat. *Annual Review of Psychology*, 67, 415–437. DOI: 10.1146/annurev-psych-073115-103235
- Spencer, S. J., Steele, C. M., & Quinn, D. M. (1999). Stereotype threat and women's math performance. *Journal of Experimental Social Psychology*, 35, 4–28. DOI: 10.1006/jesp.1998.1373
- Spencer, S. J., Zanna, M. P., & Fong, G. T. (2005). Establishing a causal chain: Why experiments are often more effective than mediational analyses in examining psychological processes. *Journal of Personality and Social Psychology*, 89, 845–851. DOI: 10.1037/0022-3514.89.6.845
- Stebleton, M. J., Soria, K. M., & Huesman, R. L., Jr. (2014). First-generation students' sense of belonging, mental health, and use of counseling services at public research universities. *Journal of College Counseling*, 17, 6–20. DOI: 10.1002/j.2161-1882.2014.00044.x

- Steele, C. M. (1988). The psychology of self-affirmation: Sustaining the integrity of the self. *Advances in Experimental Social Psychology*, 21, 261–302. DOI: 10.1016/S0065-2601(08)60229-4
- Steele, C. M. (1997). A threat in the air: How stereotypes shape intellectual identity and performance. *American Psychologist*, 52, 613–629. DOI: 10.1037/0003-066X.52.6.613
- Steele, C. M., & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African Americans. *Journal of Personality and Social Psychology*, 69, 797–811. DOI: 10.1037/0022-3514.69.5.797
- Steele, C. M., Spencer, S. J., & Aronson, J. (2002). Contending with group image: The psychology of stereotype and social identity threat. *Advances in Experimental Social Psychology*, 34, 379–440. DOI: 10.1016/S0065-2601(02)80009-0
- Stephens, N. M., Fryberg, S. A., Markus, H. R., Johnson, C. S., & Covarrubias, R. (2012a). Unseen disadvantage: How American universities' focus on independence undermines the academic performance of first-generation college students. *Journal of Personality and Social Psychology*, 102, 1178–1197. DOI: 10.1037/a0027143
- Stephens, N. M., Hamedani, M. G., & Destin, M. (2014). Closing the social-class achievement gap: A difference-education intervention improves first-generation students' academic performance and all students' college transition. *Psychological Science*, 25, 943–953. DOI: 10.1177/0956797613518349
- Stephens, N. M., Markus, H. R., & Townsend, S. S. (2007). Choice as an act of meaning: The case of social class. *Journal of Personality and Social Psychology*, 93, 814–830. DOI: 10.1037/0022-3514.93.5.814

- Stephens, N. M., Townsend, S. S., Markus, H. R., & Phillips, L. T. (2012b). A cultural mismatch: Independent cultural norms produce greater increases in cortisol and more negative emotions among first-generation college students. *Journal of Experimental Social Psychology*, 48, 1389–1393. DOI: 10.1016/j.jesp.2012.07.008
- Stone, J., & Fernandez, N. C. (2008). To practice what we preach: The use of hypocrisy and cognitive dissonance to motivate behavior change. *Social and Personality Psychology Compass*, 2, 1024-1051. DOI: 10.1111/j.1751-9004.2008.00088.x
- Stone, J., Lynch, C. I., Sjomeling, M., & Darley, J. M. (1999). Stereotype threat effects on Black and White athletic performance. *Journal of Personality and Social Psychology*, 77, 1213–1227. DOI: 10.1037/0022-3514.77.6.1213
- Szucs, D., & Ioannidis, J. P. (2017). Empirical assessment of published effect sizes and power in the recent cognitive neuroscience and psychology literature. *PLoS Biology*, 15(3), e2000797. DOI: 10.1371/journal.pbio.2000797
- Taylor, S. E., Burklund, L. J., Eisenberger, N. I., Lehman, B. J., Hilmert, C. J., & Lieberman, M. D. (2008). Neural bases of moderation of cortisol stress responses by psychosocial resources. *Journal of Personality and Social Psychology*, 95, 197–211. DOI: 10.1037/0022-3514.95.1.197
- Tibbetts, Y., Harackiewicz, J. M., Canning, E. A., Boston, J. S., Priniski, S. J., & Hyde, J. S. (2016). Affirming independence: Exploring mechanisms underlying a values affirmation intervention for first-generation students. *Journal of Personality and Social Psychology*, 110, 635–659. DOI: 10.1037/pspa0000049
- Tine, M., & Gotlieb, R. (2013). Gender-, race-, and income-based stereotype threat: The effects of multiple stigmatized aspects of identity on math performance and working memory

- function. *Social Psychology of Education*, 16, 353–376. DOI: 10.1007/s11218-013-9224-8
- Terenzini, P. T., Springer, L., Yaeger, P. M., Pascarella, E. T., & Nora, A. (1996). First-generation college students: Characteristics, experiences, and cognitive development. *Research in Higher Education*, 37, 1–22. DOI: 10.1007/BF01680039
- U.S. Department of Labor, U.S. Bureau of Labor Statistics (2016). *Current Population Survey*. Retrieved from https://www.bls.gov/emp/ep_chart_001.htm
- Walton, G. M. (2014). The new science of wise psychological interventions. *Current Directions in Psychological Science*, 23, 73–82. DOI: 10.1177/0963721413512856
- Walton, G. M., & Cohen, G. L. (2003). Stereotype lift. *Journal of Experimental Social Psychology*, 39, 456–467. DOI: 10.1016/S0022-1031(03)00019-2
- Walton, G. M. & Cohen, G. L. (2007). A question of belonging: Race, social fit, and achievement. *Journal of Personality and Social Psychology*, 92, 82–96. DOI: 10.1037/0022-3514.92.1.82
- Walton, G. M., & Cohen, G. L. (2011). A brief social-belonging intervention improves academic and health outcomes of minority students. *Science*, 331, 1447–1451. DOI: 10.1126/science.1198364
- Walton, G. M., Logel, C., Peach, J. M., Spencer, S. J., & Zanna, M. P. (2015). Two brief interventions to mitigate a “chilly climate” transform women’s experience, relationships, and achievement in engineering. *Journal of Educational Psychology*, 107, 468–485. DOI: 10.1037/a0037461
- Walton, G. M., Spencer, S. J., & Erman, S. (2013). Affirmative meritocracy. *Social Issues and Policy Review*, 7, 1–35. DOI: 10.1111/j.1751-2409.2012.01041.x

- Warburton, E., Bugarin, R., & Nunez, A. (2001). *Bridging the gap: Academic preparation and postsecondary success of first-generation students* (NCES 2001–153). Retrieved from <http://nces.ed.gov/pubs2001/2001153.pdf>
- Weiss, R. (1969/1988). *The American myth of success: From Horatio Alger to Norman Vincent Peale*. Urbana: University of Illinois Press.
- Wilson, T. D., & Buttrick, N. R. (2016). New directions in social psychological interventions to improve academic achievement. *Journal of Educational Psychology, 108*, 392–396. DOI: 10.1037/edu0000111
- Wilson, T. D., Damiani, M., & Shelton, N. (2002). Improving the academic performance of college students with brief attributional interventions. In J. Aronson (Ed.), *Improving academic achievement: Impact of psychological factors on education* (pp. 89–108). Oxford, England: Academic Press. DOI: 10.1016/B978-012064455-1/50008-7
- Wilson, T. D., & Linville, P. W. (1982). Improving the academic performance of college freshmen: Attribution therapy revisited. *Journal of Personality and Social Psychology, 42*, 367–376. DOI: 10.1037/0022-3514.42.2.367
- Wilson, T. D., & Linville, P. W. (1985). Improving the performance of college freshmen with attributional techniques. *Journal of Personality and Social Psychology, 49*, 287–293. DOI: 10.1037/0022-3514.49.1.287
- Winograd, G., & Rust, J. P. (2014). Stigma, awareness of support services, and academic help-seeking among historically underrepresented first-year college students. *The Learning Assistance Review, 19*, 19–43. Retrieved from https://nclca.wildapricot.org/resources/Documents/Publications/TLAR/Issues/19_2.pdf

Yeager, D. S., & Walton, G. M. (2011). Social-psychological interventions in education: They're not magic. *Review of Educational Research*, 81, 267–301. DOI:

10.3102/0034654311405999

York-Anderson, D. C., & Bowman, S. L. (1991). Assessing the college knowledge of first-generation and second-generation college students. *Journal of College Student Development*, 32, 116–122. Retrieved from [http://psycnet.apa.org/psycinfo/1991-22802-](http://psycnet.apa.org/psycinfo/1991-22802-001)

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Footnotes

1. The survey from Study 1 also contained scales that did not pertain to addressing the specific hypotheses of the current. Specifically, these other scales measured identity salience and centrality (based on race, socio-economic background, and college-generational status), perceived academic support, implicit theories of intelligence, academic identification, academic contingencies of self-worth, attitudes about academic engagement, perceived norms about academic engagement, perceived behavioral control over academic engagement, intentions to be academically engaged, depressive symptoms, anxiety, and illness symptoms.
2. We used participants' responses to a mass-testing survey, administered at the beginning on the semester by the psychology department, to ensure that we recruited enough FGC students (who make up about one third of the participant pool). To avoid biased sampling (e.g., self-selection), the study appeared to FGC students on the participant pool website among the list of other available studies. None of the participants were ever informed that they were specifically recruited into the study or that they met specific eligibility criteria.
3. To clean the open-response, self-reported SAT variable in Study 1, a number of specific procedures were followed. Section scores on the Math and Verbal sections of the SAT ranged between 200 and 800, so the combined Math and Verbal scores can range from 400 to 1600. Specifically, if participants clearly provided a score from the ACT (score ranging from 1 to 36) for both of the sections it was converted into an SAT score using conversion SAT-to-ACT score conversion tables. If participants appeared to provide a combined to score for Verbal and Writing (they were not asked to provide their Writing SAT score), we considered half of that score to represent their Verbal score (e.g., if they provided a Verbal score of 1100, they were given a Verbal score of 550). If participants indicated that their score on one

of the sections was on the low end of a score range, they were given 25 points (e.g., “low 600s” this was converted to a score of 625); if participants indicated that their score was around the middle of a score range, they were given 50 points (e.g., “mid 600s” this was converted to a score of 650); if participants indicated that their score was on the high end of a score range, they were given 75 points (e.g., “high 600s” this was converted to a score of 675). If participants appeared to only provide a composite score that contained all three sections of the exam (Math, Verbal, and Writing), their combined Math and Verbal score was derived by taking two-thirds of the given composite score (e.g., if a single score of 1800 was provided by the participant, it was converted to a score of 1200). If participants only provided a score on one of the sections, it was assumed that they received the same score on the other section (e.g., if a participant indicated receiving a Math score of 600, but left the Verbal section blank, they were given a score of 1200 for their combined Math and Verbal score). If participants provided a range of scores on a given section, they were given the score that fell in the middle of the range (e.g., if a participant indicated that their Verbal score was between 725 and 775, they were given a Verbal score of 750). If participants simply indicated that their score was “average” for a given section, they were given a score of 500 (the midpoint between 200 and 800). Finally, if participants provided information that could not be converted based on these procedures, they were not given a score.

4. Interestingly, these results indicate similar levels of dropping out of college—not returning for the second year of college—across the four groups. Of the students who did not enroll for classes during their second year, three were FGC-URM students, three were FGC-majority students, two were CGC-URM students, and 5 were CGC-majority students.

Table 1.

Contrast weights for the three sets of planned comparisons for Study 1.

Sets of Planned Comparisons	FGC students		CGC students	
	URM	Majority	URM	Majority
<u>First Set</u>				
Race Effect [<i>Contrast 1.1</i>]	-1	1	-1	1
College-Generation Effect [<i>Contrast 1.2</i>]	-1	-1	1	1
<u>Second Set</u>				
FGC-URM Effect [<i>Contrast 2.1</i>]	-1	.5	-	.5
College-Generation Effect for Majority students [<i>Contrast 2.2</i>]	0	-.5	-	.5
<u>Third Set</u>				
Focused College-Generation Effect [<i>Contrast 3.1</i>]	-.5	-.5	-	1
Race Effect for FGC students [<i>Contrast 3.2</i>]	-.5	.5	-	0

Table 2.

Zero-order correlations (below diagonal), partial correlations controlling for SAT (above diagonal) for Study 1.

	1	2	3	4	5	6	7	8	9	10
1. SAT scores	—	—	—	—	—	—	—	—	—	—
2. STC-Race	-.19**	—	.56***	.40***	-.11	.21**	.03	-.17*	-.10	-.15*
3. STC-SES	-.12	.50***	—	.61***	-.19*	.17*	.00	-.13	.01	-.06
4. STC-CG	-.15*	.39***	.61***	—	-.22**	.03	-.05	-.14	-.01	-.08
5. Sense of Belonging	.01	-.19**	-.24***	-.24***	—	.06	.01	.00	-.09	-.03
6. Interdependent Motives	-.29***	.25***	.15*	.14*	.02	—	.61***	-.17*	-.13*	-.16*
7. Independent Motives	-.14*	.08	.00	-.03	.03	.54***	—	-.01	.00	-.01
8. First-Year GPA	.39***	-.16*	-.16*	-.20**	-.02	-.22**	-.03	—	.71***	.91***
9. Second-Year GPA	.36***	-.14	-.05	-.08	-.06	-.19*	-.04	.75***	—	.92***
10. Cumulative Two-Year GPA	.40***	-.19*	-.10	-.16*	-.01	-.23**	-.06	.92***	.94***	—

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3.

Raw means and standard deviations for stereotype-threat concerns, belonging, and motives in Study 1 for the full sample and as a function of participants' college-generational status and race.

	Full sample <i>n</i> = 223	All <i>n</i> = 130	FGC Students		CGC Students		
			URM <i>n</i> = 40	Majority <i>n</i> = 90	All <i>n</i> = 93	URM <i>n</i> = 6	Majority <i>n</i> = 87
Raw Means (SD)							
STC-Race	3.19 (2.82)	3.84 (3.18)	6.63 (3.17)	2.60 (2.28)	2.29 (1.93)	4.67 (3.13)	2.12 (1.73)
STC-SES	4.39 (3.05)	4.92 (3.27)	6.21 (3.36)	4.35 (3.08)	3.64 (2.56)	3.78 (1.64)	3.63 (2.62)
STC-CG	4.50 (3.25)	5.23 (3.41)	5.62 (3.40)	5.05 (3.42)	3.48 (2.72)	3.22 (2.14)	3.49 (2.76)
Sense of Belonging	9.28 (2.12)	9.23 (2.12)	8.53 (2.41)	9.55 (1.91)	9.34 (2.12)	8.96 (3.38)	9.36 (2.03)
Interdependent Motives	10.32 (1.90)	10.60 (1.71)	11.31 (1.31)	10.28 (1.78)	9.93 (2.09)	11.19 (0.95)	9.84 (2.12)
Independent Motives	11.37 (1.31)	11.34 (1.28)	11.84 (1.13)	11.12 (1.28)	11.40 (1.37)	11.86 (1.01)	11.37 (1.39)
Adjusted Means (SE)							
STC-Race	3.14 (0.16)	3.46 (0.21)	-	-	2.82 (0.25)	-	-
STC-SES	4.31 (0.20)	4.76 (0.26)	-	-	3.86 (0.31)	-	-
STC-CG	4.36 (0.21)	5.18 (0.28)	-	-	3.54 (0.34)	-	-
Sense of Belonging	9.27 (0.14)	9.33 (0.19)	-	-	9.21 (0.22)	-	-
Interdependent Motives	10.29 (0.13)	10.49 (0.16)	-	-	10.09 (0.20)	-	-
Independent Motives	11.39 (0.09)	11.27 (0.12)	-	-	11.50 (0.14)	-	-

Note. SD = Standard deviation. SE = Standard error. Adjusted means control for participants' race—these adjusted means are associated with the mean comparisons for contrast 1.2. Raw means are associated with the mean comparisons for contrasts 2.1, 2.2, 3.1, and 3.2.

Table 4.

Raw and adjusted means, and standard deviations and standard errors, for the academic achievement variables in Study 1 for the full sample and as a function of participants' college-generational status and race.

	Full sample	FGC Students			CGC Students		
		All	URM	Majority	All	URM	Majority
First-Year GPAs	<i>n</i> = 182	<i>n</i> = 108	<i>n</i> = 30	<i>n</i> = 78	<i>n</i> = 74	<i>n</i> = 3	<i>n</i> = 71
Raw Means (SD)	3.28 (0.57)	3.16 (0.57)	3.01 (0.63)	3.22 (0.53)	3.46 (0.52)	2.77 (1.07)	3.49 (0.48)
Adjusted Means (SE) _{SAT}	3.12 (0.08)	3.18 (0.06)	3.13 (0.10)	3.23 (0.06)	3.05 (0.15)	2.68 (0.30)	3.43 (0.06)
Adjusted Means (SE) _{SAT,RACE}	3.30 (0.04)	3.22 (0.05)	-	-	3.37 (0.06)	-	-
Second-Year GPA	<i>n</i> = 168	<i>n</i> = 101	<i>n</i> = 27	<i>n</i> = 74	<i>n</i> = 67	<i>n</i> = 1	<i>n</i> = 66
Raw Means (SD)	3.34 (0.57)	3.26 (0.57)	3.10 (0.56)	3.31 (0.57)	3.49 (0.52)	1.99 (0.00)	3.51 (0.48)
Adjusted Means (SE) _{SAT}	3.06 (0.14)	3.27 (0.06)	3.22 (0.10)	3.32 (0.06)	2.85 (0.26)	2.24 (0.00)	3.45 (0.07)
Adjusted Means (SE) _{SAT,RACE}	3.36 (0.04)	3.31 (0.05)	-	-	3.40 (0.07)	-	-
Cumulative Two-Year GPA	<i>n</i> = 168	<i>n</i> = 101	<i>n</i> = 27	<i>n</i> = 74	<i>n</i> = 67	<i>n</i> = 1	<i>n</i> = 66
Raw Means (SD)	3.33 (0.50)	3.25 (0.49)	3.09 (0.48)	3.30 (0.48)	3.50 (0.45)	2.36 (0.00)	3.52 (0.43)
Adjusted Means (SE) _{SAT}	3.14 (0.12)	3.26 (0.05)	3.20 (0.09)	3.31 (0.05)	3.03 (0.22)	2.60 (0.45)	3.46 (0.06)
Adjusted Means (SE) _{SAT,RACE}	3.35 (0.40)	3.30 (0.05)	-	-	3.42 (0.06)	-	-

Note. SD = Standard deviation. SE = Standard error. Adjusted Means_{SAT} = Means adjusted for SAT scores. Adjusted Means_{SAT, RACE} = Means adjusted for SAT scores and participant race.

Table 5.

Indirect effects [and bias-corrected 95% confidence intervals generated from 10,000 bootstrapped samples] from single-mediator models for contrasts 1.2, 3.1, 2.2 predicting achievement controlling for SAT in Study 1.

Contrast	Mediator	First-Year GPA	Second-Year GPA	Cumulative Two-Year GPA
College-Gen Effect [Contrast 1.2]	STC-Race	-.00 [-.02, .01]	.00 [-.01, .02]	.01 [-.01, .02]
	STC-SES	.01 [-.00, .03]	-.00 [-.02, .01]	.00 [-.01, .01]
	STC-CG	.01 [-.00, .04]	-.00 [-.02, .01]	.00 [-.01, .02]
	Sense of Belonging	.00 [-.00, .01]	.00 [-.01, .02]	.00 [-.00, .01]
	Interdependent Motives	.00 [-.00, .02]	.00 [-.00, .03]	.01 [-.00, .03]
	Independent Motives	.00 [-.00, .02]	.00 [-.01, .01]	.00 [-.00, .01]
Focused College-Gen Effect [Contrast 3.1]	STC-Race	.02 [-.06, .08]	.02 [-.05, .09]	.03 [-.02, .09]
	STC-SES	.02 [-.01, .05]	-.01 [-.05, .02]	.00 [-.03, .03]
	STC-CG	.02 [-.00, .06]	-.00 [-.03, .02]	.01 [-.01, .03]
	Sense of Belonging	.00 [-.01, .02]	-.00 [-.02, .01]	-.00 [-.01, .01]
	Interdependent Motives	.01 [-.00, .05]	.01 [-.00, .05]	.01 [-.00, .05]
	Independent Motives	-.00 [-.01, .01]	-.00 [-.01, .01]	-.00 [-.01, .01]
College-Gen Effect for Majority students [Contrast 2.2]	STC-Race	.01 [-.02, .04]	.01 [-.01, .05]	.01 [-.00, .05]
	STC-SES	.01 [-.01, .05]	-.01 [-.05, .01]	.00 [-.02, .03]
	STC-CG	.03 [-.00, .08]	-.00 [-.04, .03]	.01 [-.01, .05]
	Sense of Belonging	-.00 [-.02, .01]	.00 [-.01, .04]	.00 [-.01, .03]
	Interdependent Motives	.01 [-.01, .05]	.01 [-.01, .06]	.01 [-.00, .05]
	Independent Motives	.00 [-.01, .03]	.00 [-.01, .03]	.00 [-.01, .02]

Note. Mediation models were run using the SPSS PROCESS macro version 2.16.3 (Hayes, 2013, Model 4). Confidence intervals that contain zero are considered non-significant—none of the indirect effects in this table are significant.

Table 6.

Indirect effects [and bias-corrected 95% confidence intervals generated from 10,000 bootstrapped samples] from single-mediator models for contrasts 2.1 and 3.2 predicting achievement controlling for SAT in Study 1.

Contrast	Mediator	First-Year GPA	Second-Year GPA	Cumulative Two-Year GPA
FGC-URM Effect [Contrast 2.1]	STC-Race	.03 [-.09, .13]	.03 [-.08, .15]	.05 [-.04, .15]
	STC-SES	.02 [-.02, .08]	-.01 [-.06, .02]	.00 [-.03, .04]
	STC-CG	.01 [-.00, .06]	-.00 [-.02, .01]	.00 [-.00, .03]
	Sense of Belonging	.00 [-.01, .03]	-.00 [-.05, .01]	-.00 [-.03, .01]
	Interdependent Motives	.02 [-.00, .05]	.02 [-.00, .06]	.02 [-.00, .05]
	Independent Motives	-.00 [-.03, .02]	-.00 [-.03, .03]	-.00 [-.02, .02]
Race Effect for FGC students [Contrast 3.2]	STC-Race	.04 [-.12, .19]	.05 [-.11, .21]	.08 [-.05, .21]
	STC-SES	.03 [-.02, .10]	-.01 [-.08, .03]	.00 [-.04, .06]
	STC-CG	.01 [-.02, .06]	.00 [-.02, .02]	.00 [-.02, .02]
	Sense of Belonging	.00 [-.02, .04]	-.01 [-.08, .01]	-.00 [-.04, .01]
	Interdependent Motives	.02 [-.00, .08]	.02 [-.00, .08]	.02 [-.00, .07]
	Independent Motives	-.00 [-.05, .03]	-.00 [-.05, .04]	-.00 [-.04, .04]

Note. Mediation models were run using the SPSS PROCESS macro version 2.16.3 (Hayes, 2013, Model 4). Confidence intervals that contain zero are considered non-significant—none of the indirect effects in this table are significant.

Table 7.

Random intercept model and linear growth models with different between- and within-participant variance-covariance structures examining semester-GPA trajectories from Fall 2014 to Spring 2016 for Study 1.

	Random Intercept	Model A	Model B	Model C
<u>Fixed Effects</u>				
Intercept (γ_{00})	3.19	3.28	3.28	3.27
Semester (γ_{10})		-.066	-.066	-.065
<u>Random Effects</u>				
τ_{00}	.258	.198	.204	.171
τ_{11}		.051	.052	.051
τ_{01}		.004		
σ^2	.430	.335	.334	.372
ρ				.133
<u>Overall Model Test</u>				
Deviance	1699.68	1656.01	1656.05	1664.59
AIC	1705.68	1668.01	1666.06	1676.59
BIC	1719.49	1695.63	1689.07	1704.25

Note. **Bolded** values for the fixed and random effects are significant ($p < .05$). Random intercept model included no predictors and used an unstructured between-participant variance-covariance structure and an identity within-participant covariance structure. Model A tests a simple linear growth model with an unstructured between-participant variance-covariance structure. Model B tests a simple linear growth model with a diagonal between-participant variance-covariance structure. Models A and B use identity within-participant covariance structures. Model C tests a simple linear growth model with a diagonal between-participant variance-covariance structure and a first-order autoregressive within-participant covariance structure.

Table 8.

Linear growth models examining how semester-GPA trajectories from Fall 2014 to Spring 2016 differ between URM and majority students controlling for college-generational status (contrast 1.1) and between FGC and CGC students controlling for race (contrast 1.2), and how stereotype-threat concern, sense of belonging, and motives for attending college moderates these differences in semester-GPA trajectories for Study 1.

	Model 1A	Model 1B	Model 1C	Model 1D	Model 1E	Model 1F	Model 1G
<u>Fixed Effects</u>							
Intercept (γ_{00})	3.17	3.12	3.21	3.18	3.18	3.16	3.13
Semester (γ_{10})	-.055	-.096	-.064	-.057	-.060	-.054	-.062
SAT (γ_{01})	.001	.001	.001	.001	.001	.001	.001
Contrast 1.1 (γ_{02})	.165	.194	.119	.163	.153	.162	.203
Contrast 1.2 (γ_{03})	.066	.045	.059	.050	.075	.057	.068
Predictor (γ_{04})		-.012	-.032	-.018	.008	-.035	.063
Contrast 1.1*Predictor (γ_{05})		-.002	.019	-.010	.030	.026	-.091
Contrast 1.2*Predictor (γ_{06})		-.027	.005	.019	-.029	.001	-.037
Semester*Contrast 1.1 (γ_{11})	-.006	.048	.003	-.006	.003	-.004	.002
Semester*Contrast 1.2 (γ_{12})	-.026	-.013	-.028	-.018	-.034	-.023	-.023
Semester*Predictor (γ_{13})		.024	.004	.011	.017	.008	.024
Semester*Contrast 1.1*Predictor (γ_{14})		-.010	.005	.004	-.021	.003	-.019
Semester*Contrast 1.2*Predictor (γ_{15})		.008	-.013	-.010	.029	.001	.014
<u>Random Effects</u>							
τ_{00}	.162	.162	.158	.158	.160	.154	.152
τ_{11}	.051	.051	.048	.048	.052	.051	.052
σ^2	.306	.302	.307	.306	.301	.306	.304
<u>Model Fit</u>							
Deviance	1501.17	1496.43	1495.31	1492.86	1493.51	1496.17	1493.23
AIC	1521.17	1528.43	1527.31	1524.86	1525.51	1528.17	1525.23
BIC	1566.68	1601.25	1600.13	1597.67	1598.33	1600.98	1598.04

Note. **Bolded** values for the fixed and random effects indicate statistical significance ($p < .05$). SAT and all predictors are grand-mean centered. Model 1B predictor: STC-Race. Model 1C predictor: STC-SES. Model 1D predictor: STC-CG. Model 1E predictor: Sense of Belonging. Model 1F predictor: Interdependent Motives. Model 1G predictor: Independent Motives.

Table 9.

Linear growth models examining how semester-GPA trajectories from Fall 2014 to Spring 2016 differ between FGC-URM students and majority students (contrast 2.1) and between FGC-majority and CGC-majority students (contrast 2.2), and how stereotype-threat concern, sense of belonging, and motives for attending college moderates these differences in semester-GPA trajectories for Study 1.

	Model 2A	Model 2B	Model 2C	Model 2D	Model 2E	Model 2F	Model 2G
<u>Fixed Effects</u>							
Intercept (γ_{00})	3.24	3.27	3.29	3.25	3.24	3.24	3.21
Semester (γ_{10})	-.040	-.053	-.044	-.044	-.038	-.037	-.041
SAT (γ_{01})	.001	.001	.001	.001	.001	.001	.001
Contrast 2.1 (γ_{02})	.195	.080	.091	.167	.177	.174	.244
Contrast 2.2 (γ_{03})	.190	.134	.187	.157	.204	.176	.184
Predictor (γ_{04})		-.022	-.033	-.035	.037	-.049	.032
Contrast 2.1*Predictor (γ_{05})		.016	.046	.015	.004	-.014	-.120
Contrast 2.2*Predictor (γ_{06})		-.063	.014	.027	-.042	.018	-.075
Semester*Contrast 2.1 (γ_{11})	-.041	.012	-.033	-.038	-.039	-.038	-.039
Semester*Contrast 2.2 (γ_{12})	-.032	-.009	-.040	-.018	-.042	-.025	-.029
Semester*Predictor (γ_{13})		.015	.008	.014	-.002	.008	.004
Semester*Contrast 2.1*Predictor (γ_{14})		-.001	.002	.002	-.004	.007	.001
Semester*Contrast 2.2*Predictor (γ_{15})		.018	-.027	-.021	.050	.007	.025
<u>Random Effects</u>							
τ_{00}	.148	.146	.139	.143	.144	.141	.142
τ_{11}	.049	.049	.048	.047	.049	.049	.050
σ^2	.291	.289	.290	.289	.288	.290	.290
<u>Model Fit</u>							
Deviance	1446.52	1443.00	1436.75	1436.98	1439.69	1441.59	1441.54
AIC	1466.52	1475.00	1468.75	1468.98	1471.69	1473.59	1473.54
BIC	1511.92	1547.63	1541.38	1541.61	1544.32	1546.23	1546.17

Note. Bolded values for the fixed and random effects indicate statistical significance ($p < .05$). SAT and all predictors are grand-mean centered. Model 2B predictor: STC-Race. Model 2C predictor: STC-SES. Model 2D predictor: STC-CG. Model 2E predictor: Sense of Belonging. Model 2F predictor: Interdependent Motives. Model 2G predictor: Independent Motives.

Table 10.

Linear growth models examining how semester-GPA trajectories from Fall 2014 to Spring 2016 differ between FGC students and CGC-majority students (contrast 3.1) and between FGC-URM and FGC-majority students (contrast 3.2), and how stereotype-threat concern, sense of belonging, and motives for attending college moderates these differences in semester-GPA trajectories for Study 1.

	Model 3A	Model 3B	Model 3C	Model 3D	Model 3E	Model 3F	Model 3G
<u>Fixed Effects</u>							
Intercept (γ_{00})	3.24	3.27	3.29	3.25	3.24	3.24	3.21
Semester (γ_{10})	-.040	-.053	-.044	-.044	-.038	-.037	-.041
SAT (γ_{01})	.001	.001	.001	.001	.001	.001	.001
Contrast 3.1 (γ_{02})	.192	.107	.139	.162	.191	.175	.214
Contrast 3.2 (γ_{03})	.198	.053	.043	.172	.163	.173	.274
Predictor (γ_{04})		-.022	-.033	-.034	.037	-.049	.032
Contrast 3.1*Predictor (γ_{05})		-.023	.030	.021	-.019	.002	-.097
Contrast 3.2*Predictor (γ_{06})		.056	.063	.009	.027	-.029	-.142
Semester*Contrast 3.1 (γ_{11})	-.037	.001	-.036	-.028	-.041	-.032	-.034
Semester*Contrast 3.2 (γ_{12})	-.046	.022	-.030	-.047	-.037	-.044	-.044
Semester*Predictor (γ_{13})		.015	.008	.014	-.002	.008	.004
Semester*Contrast 3.1*Predictor (γ_{14})		.008	-.012	-.010	.023	.007	.013
Semester*Contrast 3.2*Predictor (γ_{15})		-.010	.016	.013	-.032	.007	-.011
<u>Random Effects</u>							
τ_{00}	.148	.146	.139	.143	.144	.141	.142
τ_{11}	.049	.049	.048	.047	.049	.049	.050
σ^2	.291	.289	.290	.289	.288	.290	.290
<u>Model Fit</u>							
Deviance	1446.52	1443.00	1436.75	1436.98	1439.69	1441.59	1441.54
AIC	1466.52	1475.00	1468.75	1468.98	1471.69	1473.59	1473.54
BIC	1511.92	1547.63	1541.38	1541.61	1544.32	1546.23	1546.17

Note. **Bolded** values for the fixed and random effects indicate statistical significance ($p < .05$). SAT and all predictors are grand-mean centered. Model 3B predictor: STC-Race. Model 3C predictor: STC-SES. Model 3D predictor: STC-CG. Model 3E predictor: Sense of Belonging. Model 3F predictor: Interdependent Motives. Model 3G predictor: Independent Motives.

Table 11.

Raw means and standard deviations for preintervention and post-intervention stereotype-threat concerns and sense of belonging in college, as well as raw and adjusted means and standard deviations and standard errors for full-year GPAs, for the full sample and as a function of participants' college-generational status and race for Study 2.

	Full sample	FGC Students			CGC Students		
		All	URM	Majority	All	URM	Majority
Preintervention	<i>n</i> = 535	<i>n</i> = 212	<i>n</i> = 70	<i>n</i> = 142	<i>n</i> = 323	<i>n</i> = 47	<i>n</i> = 276
STC-Race	4.05 (3.41)	4.84 (3.63)	7.52 (3.38)	3.51 (2.96)	3.53 (3.17)	5.50 (3.48)	3.19 (2.99)
STC-SES	4.80 (3.28)	5.99 (3.54)	7.88 (3.67)	5.06 (3.09)	4.02 (2.84)	5.15 (3.00)	3.83 (2.76)
STC-CG	4.50 (3.33)	5.91 (3.52)	7.38 (3.67)	5.19 (3.22)	3.58 (2.85)	4.52 (3.11)	3.42 (2.77)
Sense of Belonging	8.93 (1.74)	8.73 (1.85)	8.29 (1.82)	8.95 (1.83)	9.05 (1.65)	8.82 (1.72)	9.09 (1.63)
Post-Intervention	<i>n</i> = 291	<i>n</i> = 113	<i>n</i> = 35	<i>n</i> = 78	<i>n</i> = 178	<i>n</i> = 21	<i>n</i> = 157
STC-Race	4.35 (3.11)	4.83 (3.59)	7.30 (3.39)	3.72 (3.11)	4.05 (2.73)	6.21 (2.69)	3.75 (2.61)
STC-SES	5.31 (3.16)	6.06 (3.46)	7.60 (3.75)	5.36 (3.11)	4.84 (2.85)	5.52 (2.76)	4.74 (2.86)
STC-CG	4.89 (3.15)	5.89 (3.25)	6.39 (3.34)	5.66 (3.21)	4.26 (2.92)	4.38 (2.47)	4.24 (2.98)
Sense of Belonging	8.79 (1.70)	8.59 (1.74)	8.28 (1.50)	8.73 (1.83)	8.92 (1.66)	9.35 (1.87)	8.86 (1.63)
Full-Year GPA	<i>n</i> = 427	<i>n</i> = 168	<i>n</i> = 52	<i>n</i> = 116	<i>n</i> = 259	<i>n</i> = 38	<i>n</i> = 221
Raw GPA	3.25 (0.59)	3.08 (0.62)	2.97 (0.66)	3.13 (0.61)	3.36 (0.55)	3.21 (0.62)	3.38 (0.53)
Adjusted GPA	3.23 (0.03)	3.18 (0.05)	3.21 (0.08)	3.16 (0.05)	3.28 (0.05)	3.26 (0.09)	3.30 (0.04)

Note. Adjusted GPA = Full-Year GPA adjusted for participants' standardized test scores. Standard errors are presented in parentheses with the means for adjusted GPAs (not standard deviations).

Table 12.

Raw means and standard deviations for post-intervention stereotype-threat concerns, sense of belonging in college, and full-year GPAs as a function of intervention condition, college-generational status, and race for Study 2.

Intervention Condition	FGC Students			CGC Students		
	All	URM	Majority	All	URM	Majority
Affirmation Training						
Full-Year GPA	3.02 (0.59)	3.06 (0.50)	2.99 (0.63)	3.42 (0.51)	3.24 (0.61)	3.45 (0.49)
STC-Race	4.50 (3.59)	6.00 (3.77)	3.77 (3.33)	3.78 (2.67)	5.17 (3.53)	3.69 (2.62)
STC-SES	5.88 (3.63)	6.20 (4.31)	5.73 (3.31)	4.55 (2.68)	5.50 (3.11)	4.49 (2.67)
STC-CG	6.09 (3.09)	5.51 (3.39)	6.38 (2.95)	3.78 (2.80)	5.08 (2.83)	3.70 (2.80)
Sense of Belonging	9.11 (1.82)	9.05 (1.43)	9.13 (2.00)	9.11 (1.69)	9.76 (2.21)	9.06 (1.66)
Academic Engagement						
Full-Year GPA	3.17 (0.63)	3.15 (0.60)	3.18 (0.65)	3.29 (0.57)	3.20 (0.56)	3.30 (0.58)
STC-Race	5.60 (3.88)	9.50 (1.87)	3.90 (3.24)	4.31 (2.83)	6.59 (2.16)	3.71 (2.70)
STC-SES	6.31 (3.52)	9.27 (2.78)	5.03 (3.02)	4.78 (2.90)	5.56 (2.29)	4.58 (3.03)
STC-CG	5.60 (3.78)	6.80 (4.01)	5.07 (3.65)	4.50 (3.03)	4.13 (2.38)	4.60 (3.19)
Sense of Belonging	8.12 (1.59)	7.70 (1.34)	8.30 (1.69)	9.06 (1.62)	9.15 (1.89)	9.04 (1.57)
No-Intervention Control						
Full-Year GPA	3.04 (0.65)	2.68 (0.78)	3.20 (0.52)	3.37 (0.56)	3.20 (0.80)	3.39 (0.51)
STC-Race	4.53 (3.29)	7.07 (3.08)	3.47 (2.80)	4.05 (2.70)	6.00 (3.87)	3.88 (2.56)
STC-SES	6.04 (3.27)	8.03 (3.16)	5.21 (3.00)	5.29 (3.00)	5.42 (4.50)	5.28 (2.91)
STC-CG	5.88 (2.97)	7.30 (2.38)	5.29 (3.04)	4.58 (2.91)	4.50 (3.00)	4.59 (2.94)
Sense of Belonging	8.36 (1.62)	7.71 (1.33)	8.63 (1.68)	8.49 (1.64)	9.59 (1.94)	8.39 (1.60)

Table 13.

Adjusted means and standard errors for post-intervention stereotype-threat concerns, sense of belonging in college, and full-year GPAs as a function of intervention condition, college-generational status, and race for Study 2.

Intervention Condition	FGC Students			CGC Students		
	All	URM	Majority	All	URM	Majority
Affirmation Training						
Full-Year GPA	3.17 (0.08)	3.32 (0.13)	3.02 (0.09)	3.27 (0.08)	3.23 (0.15)	3.30 (0.06)
STC-Race	3.99 (0.37)	3.84 (0.61)	4.15 (0.41)	3.74 (0.59)	3.45 (1.15)	4.03 (0.29)
STC-SES	5.28 (0.42)	5.02 (0.69)	5.55 (0.47)	4.66 (0.68)	4.50 (1.32)	4.82 (0.34)
STC-CG	5.02 (0.44)	3.99 (0.73)	6.05 (0.49)	4.64 (0.70)	5.03 (1.36)	4.25 (0.36)
Sense of Belonging	9.11 (0.19)	9.04 (.0.32)	9.19 (0.22)	9.15 (0.32)	9.34 (0.62)	8.96 (0.16)
Academic Engagement						
Full-Year GPA	3.27 (0.08)	3.34 (0.13)	3.21 (0.08)	3.27 (0.07)	3.27 (0.13)	3.27 (0.06)
STC-Race	5.47 (0.44)	6.82 (0.75)	4.12 (0.48)	5.37 (0.36)	6.35 (0.63)	4.38 (0.33)
STC-SES	6.01 (0.51)	6.70 (0.87)	5.32 (0.55)	5.43 (0.41)	5.96 (0.73)	4.91 (0.37)
STC-CG	5.34 (0.52)	5.57 (0.87)	5.11 (0.57)	4.64 (0.43)	4.25 (0.76)	5.03 (0.39)
Sense of Belonging	8.34 (0.24)	8.30 (0.39)	8.38 (0.26)	9.01 (0.19)	9.15 (0.34)	8.87 (0.18)
No-Intervention Control						
Full-Year GPA	3.09 (0.08)	2.95 (0.13)	3.23 (0.09)	3.31 (0.10)	3.26 (0.19)	3.36 (0.07)
STC-Race	4.85 (0.43)	5.98 (0.73)	3.71 (0.47)	5.00 (0.59)	6.02 (1.14)	3.97 (0.34)
STC-SES	6.04 (0.50)	7.32 (0.83)	4.75 (0.54)	5.53 (0.69)	5.28 (1.31)	5.78 (0.40)
STC-CG	5.73 (0.52)	6.52 (0.87)	4.93 (0.56)	4.43 (0.71)	4.14 (1.36)	4.71 (.406)
Sense of Belonging	8.38 (0.23)	8.26 (0.39)	8.49 (0.25)	9.15 (0.32)	9.81 (0.62)	8.49 (0.18)

Note. Means for STC-Race, STC-SES, STC-CG, and Sense of Belonging are adjusted for preintervention scores on each variable. Means for Full-Year GPAs are adjusted for standardized test scores.

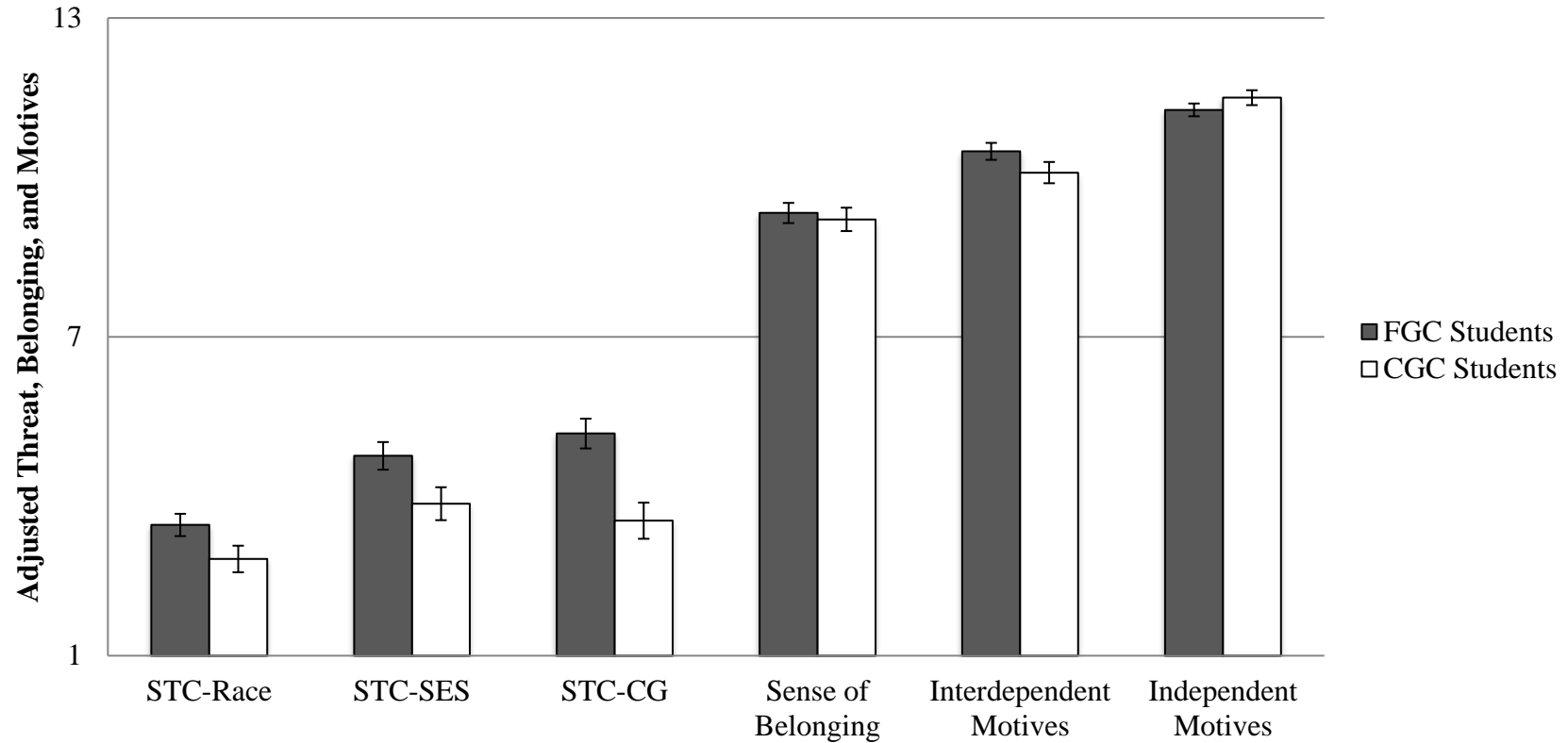


Figure 1. Study 1: Adjusted means for STC-Race, STC-SES, STC-CG, sense of belonging, and interdependent and independent motives for attending college as a function of participants' college-generational status (controlling for participant race)—the means associated with contrast 1.2. Higher numbers indicate more of the construct of interest.

Error bars represent ± 1 standard errors.

$N_{FGC} = 130$, $N_{CGC} = 93$.

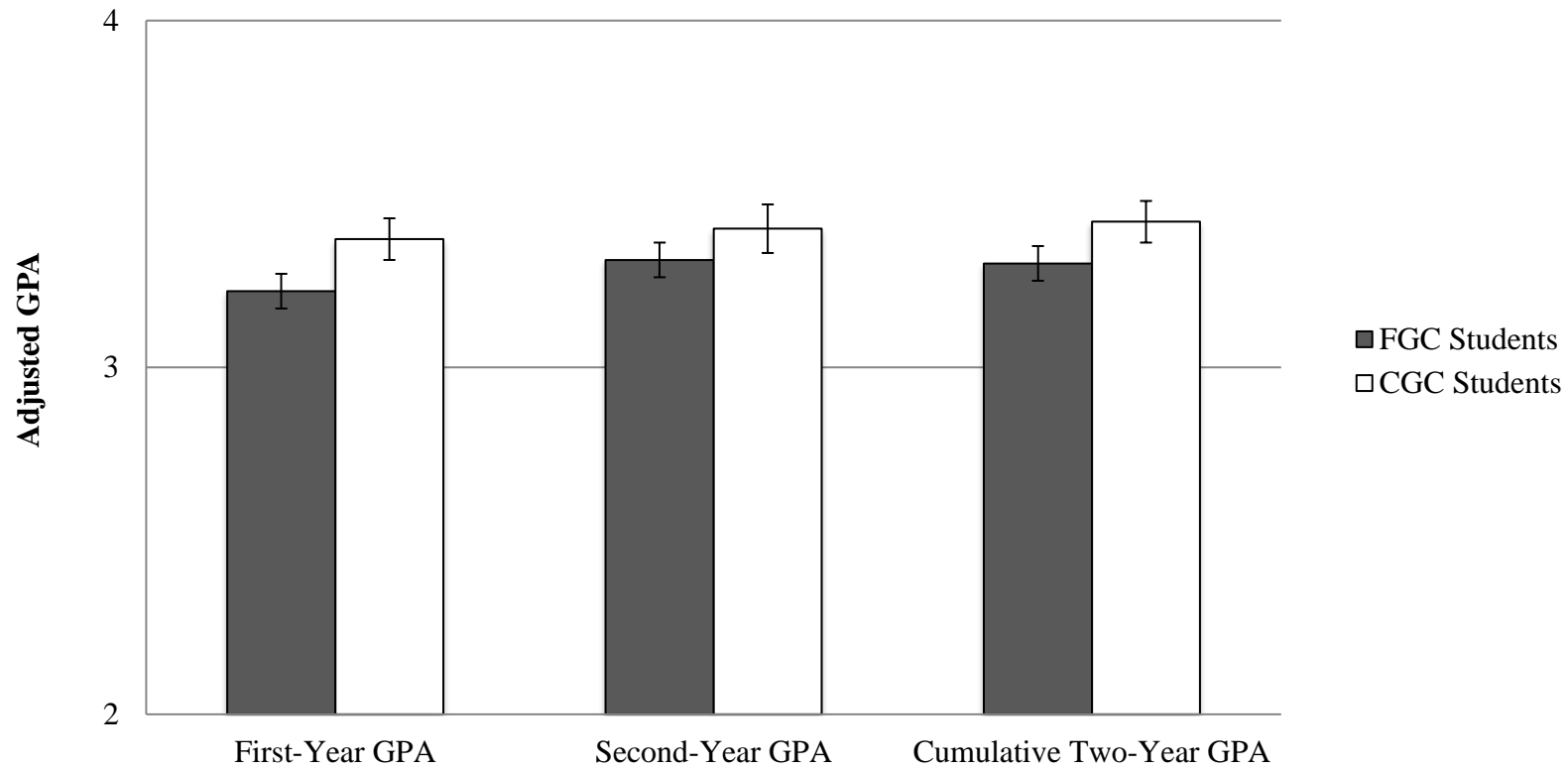


Figure 2. Study 1: Adjusted means for first-year, second-year, and cumulative two-year GPA as a function of participants' college-generational status (controlling for participant race and SAT scores)—the means associated with contrast 1.2.

Error bars represent +/- 1 standard errors.

First-Year GPA: $N_{FGC} = 108$, $N_{CGC} = 74$.

Second-Year and Cumulative Two-Year GPA: $N_{FGC} = 101$, $N_{CGC} = 67$.

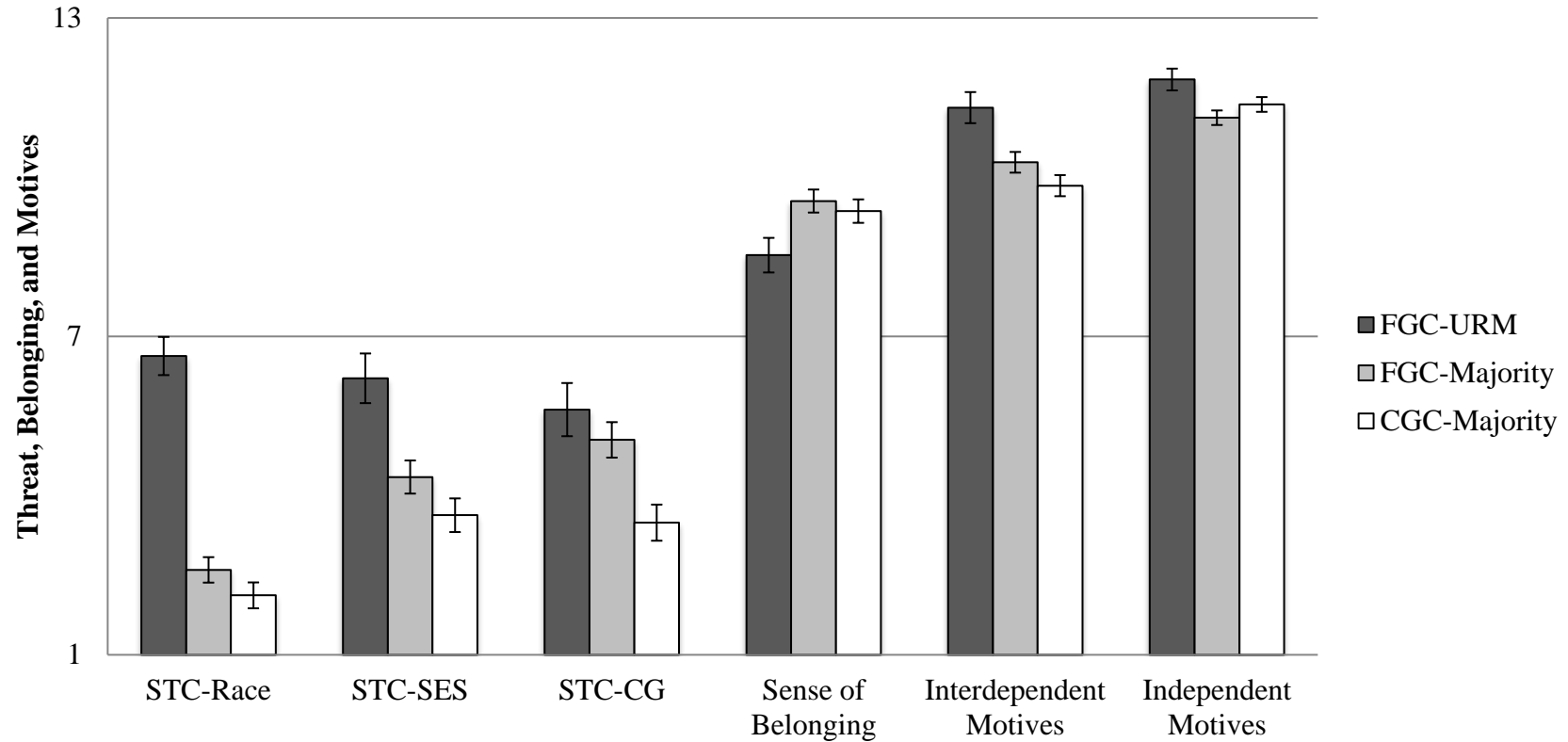


Figure 3. Study 1: Means for STC-Race, STC-SES, STC-CG, sense of belonging, and interdependent and independent motives for attending college as a function of participants' college-generational status and race—the means associated with the three cells of the design related to contrasts 2.1, 2.2, 3.1, and 3.2.

Error bars represent +/- 1 standard errors.

$N_{FGC-URM} = 40$, $N_{FGC-Majority} = 90$, $N_{CGC-Majority} = 87$.

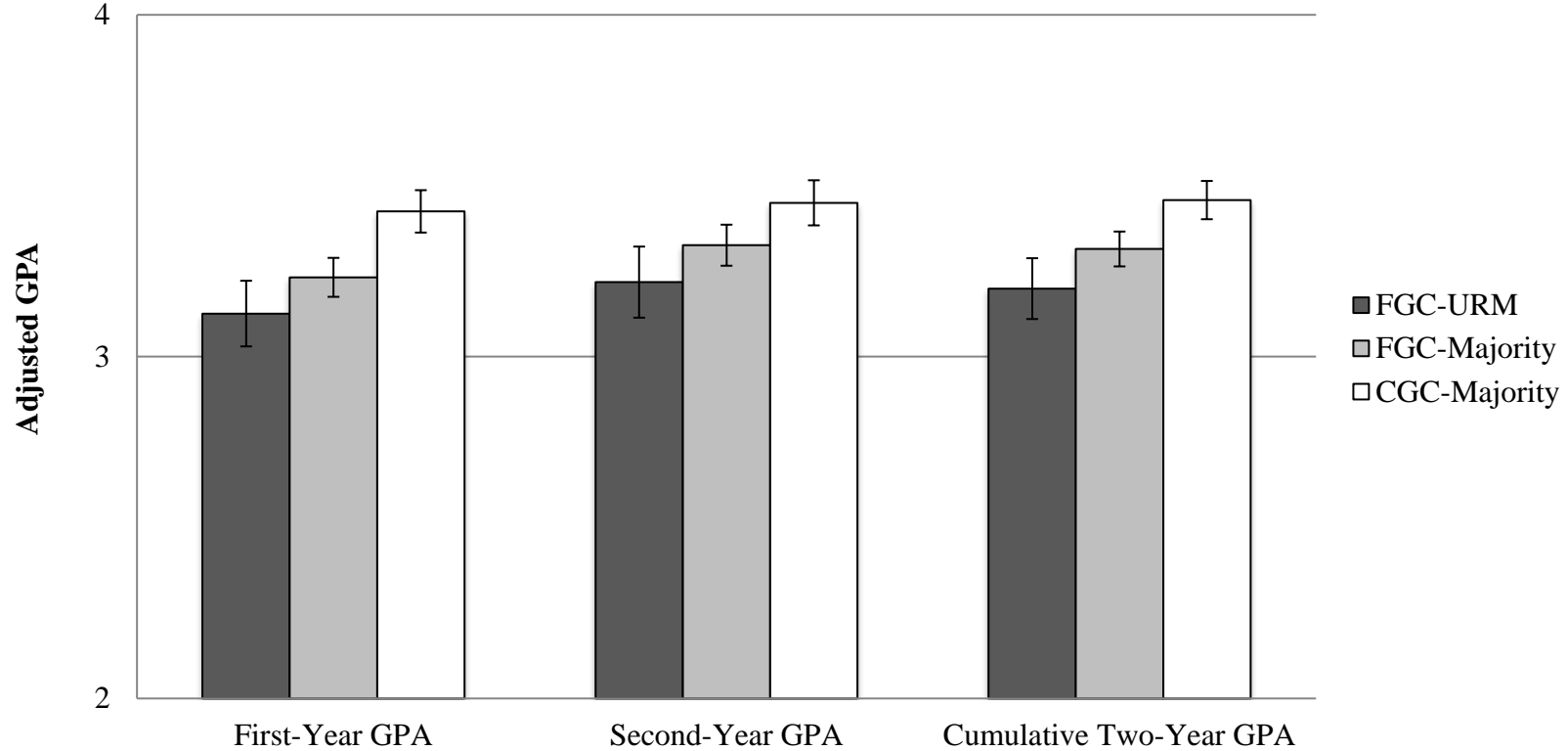


Figure 4. Study 1: Adjusted means for first-year, second-year, and cumulative two-year GPA as a function of participants' college-generational status and race (controlling for SAT scores)—the means associated with the three cells of the design related to contrasts 2.1, 2.2, and 3.2.

Error bars represent +/- 1 standard errors.

First-Year GPA: $N_{FGC-URM} = 30$, $N_{FGC-Majority} = 78$, $N_{CGC-Majority} = 71$.

Second-Year and Cumulative Two-Year GPA: $N_{FGC-URM} = 27$, $N_{FGC-Majority} = 74$, $N_{CGC-Majority} = 66$.

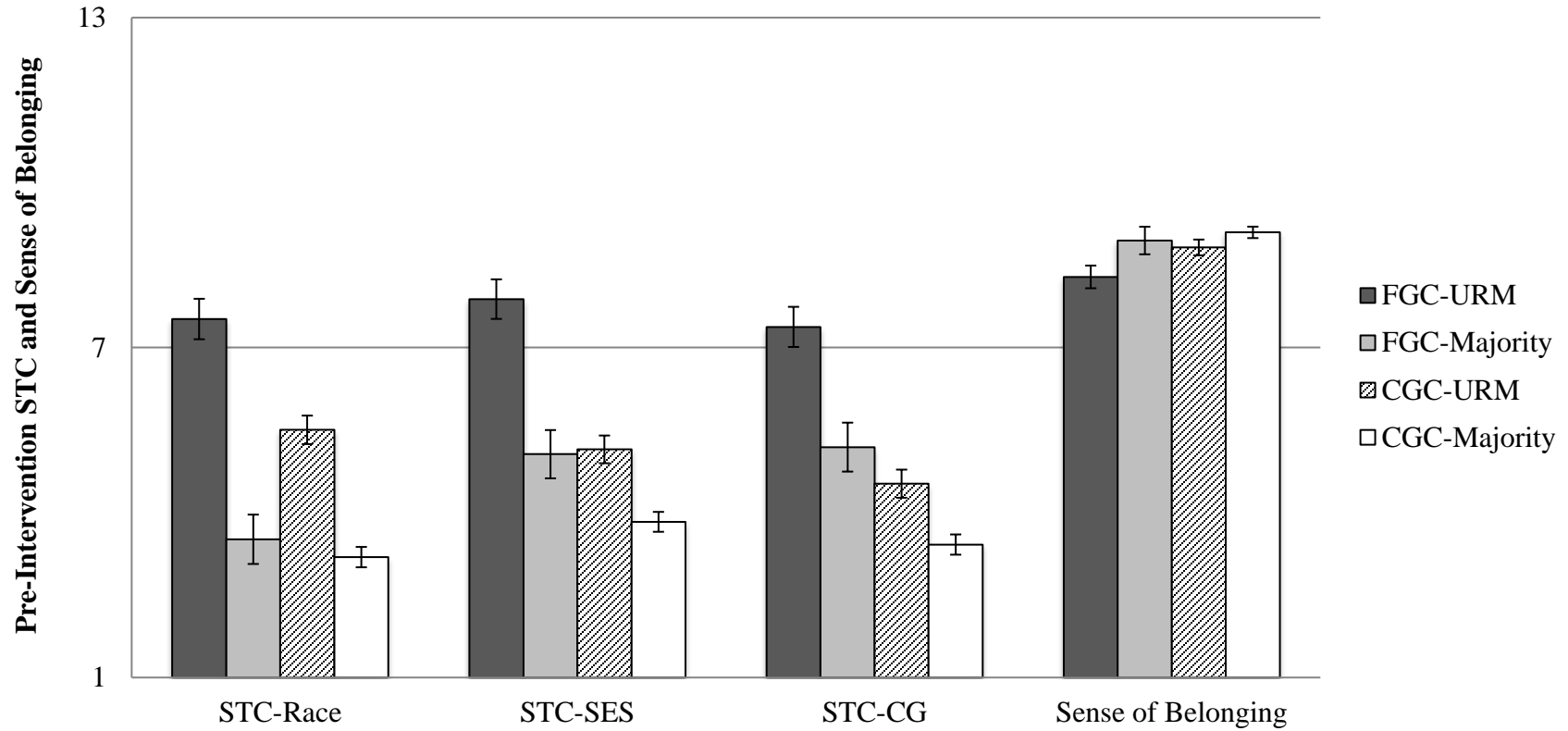


Figure 5. Study 2: Pre-intervention scores for STC-Race, STC-SES, STC-CG, and sense of belonging as a function of participants' college-generational status and race/ethnicity.

Error bars represent +/- 1 standard errors.

$N_{FGC-URM} = 70$, $N_{FGC-Majority} = 142$, $N_{CGC-URM} = 47$, $N_{CGC-Majority} = 276$.

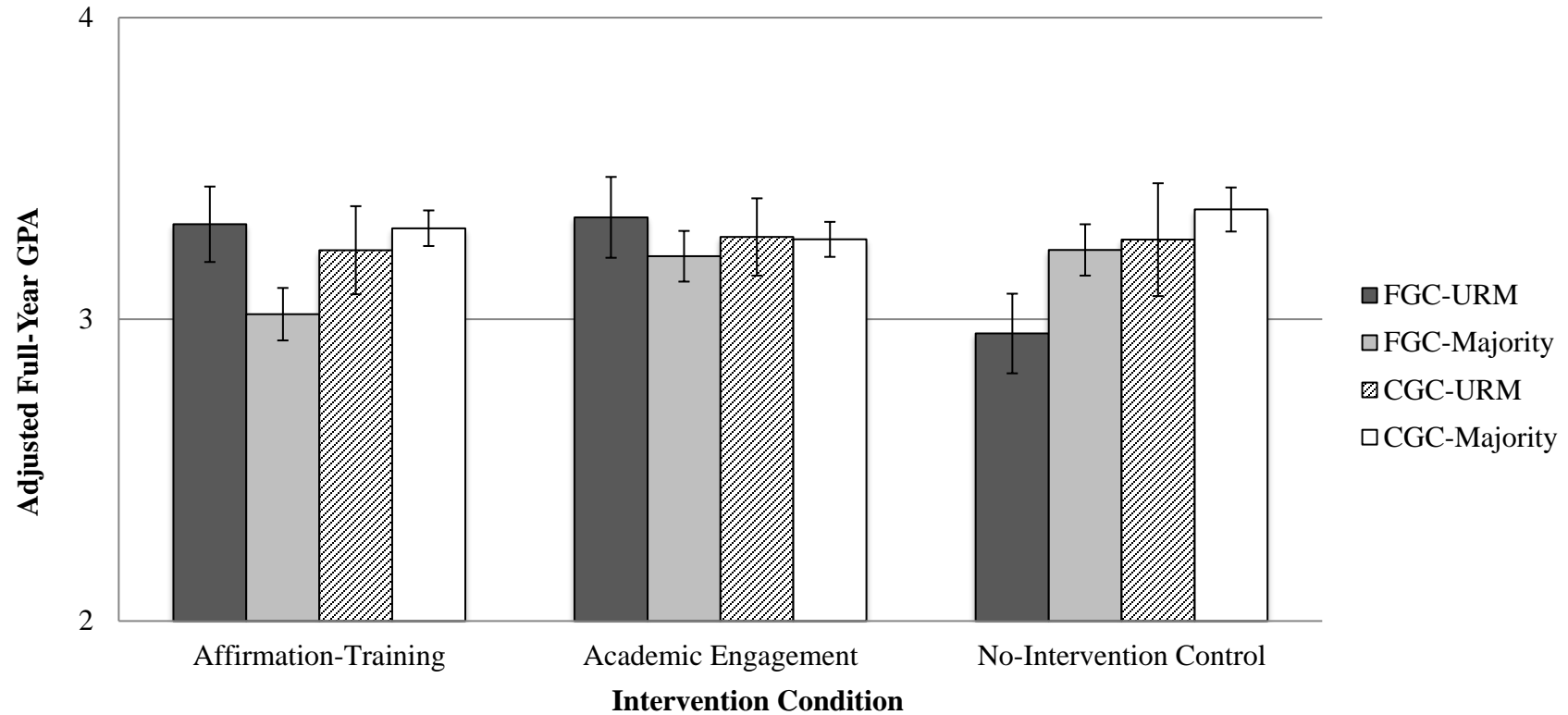


Figure 6. Study 2: Full-year GPA (adjusted for standardized test scores) as a function of college-generational status, race/ethnicity, and intervention condition.

Error bars represent +/- 1 standard errors.

Affirmation-Training Intervention Condition: $N_{FGC-URM} = 19$, $N_{FGC-Majority} = 37$, $N_{CGC-URM} = 13$, $N_{CGC-Majority} = 86$.

Academic-Engagement Intervention Condition: $N_{FGC-URM} = 16$, $N_{FGC-Majority} = 40$, $N_{CGC-URM} = 17$, $N_{CGC-Majority} = 82$.

No-Intervention Control Condition: $N_{FGC-URM} = 17$, $N_{FGC-Majority} = 39$, $N_{CGC-URM} = 8$, $N_{CGC-Majority} = 53$.

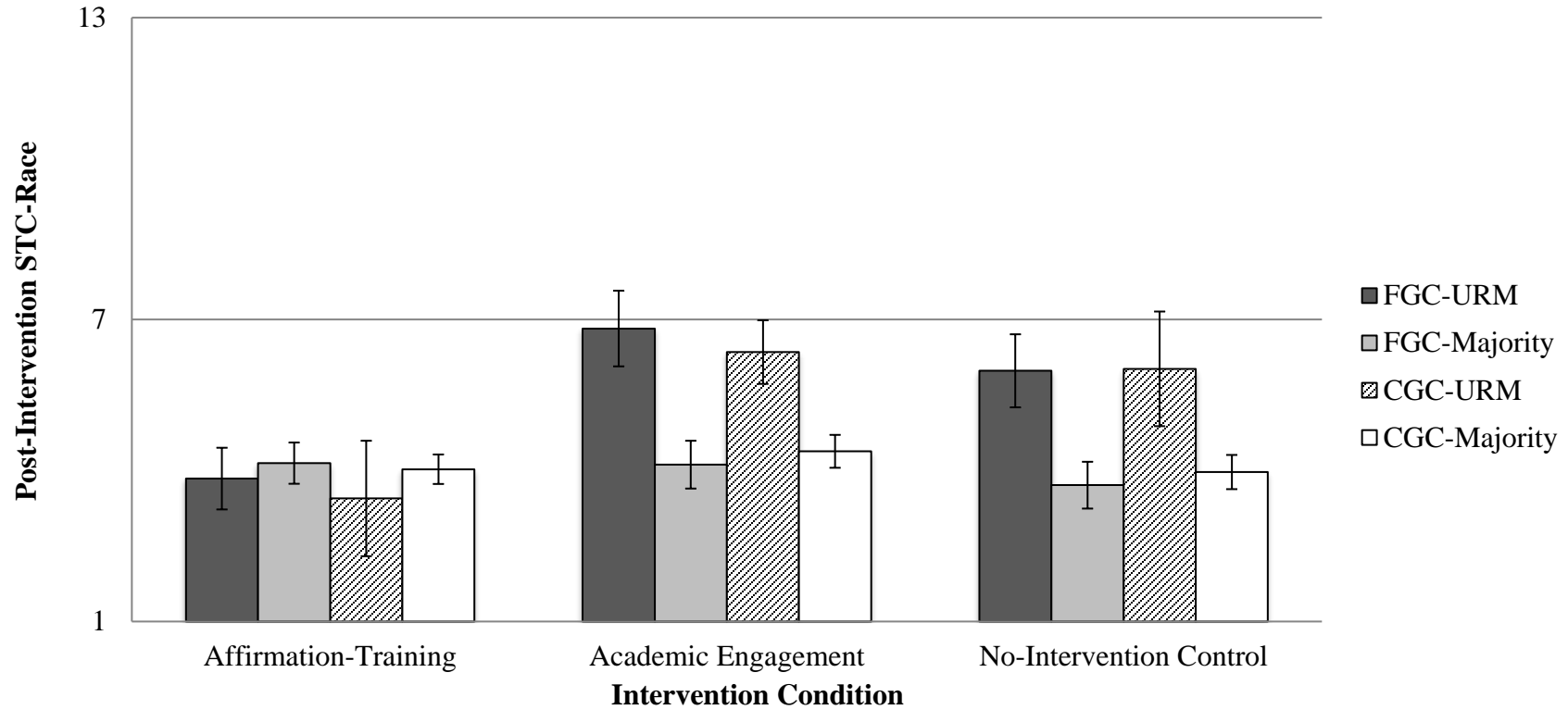


Figure 7. Study 2: Post-intervention stereotype-threat concern based on race (adjusted for pre-intervention STC-Race) as a function of college-generational status, race/ethnicity, and intervention condition.

Error bars represent +/- 1 standard errors.

Affirmation-Training Intervention Condition: $N_{FGC-URM} = 15$, $N_{FGC-Majority} = 31$, $N_{CGC-URM} = 4$, $N_{CGC-Majority} = 61$.

Academic-Engagement Intervention Condition: $N_{FGC-URM} = 10$, $N_{FGC-Majority} = 23$, $N_{CGC-URM} = 13$, $N_{CGC-Majority} = 50$.

No-Intervention Control Condition: $N_{FGC-URM} = 10$, $N_{FGC-Majority} = 24$, $N_{CGC-URM} = 4$, $N_{CGC-Majority} = 45$.

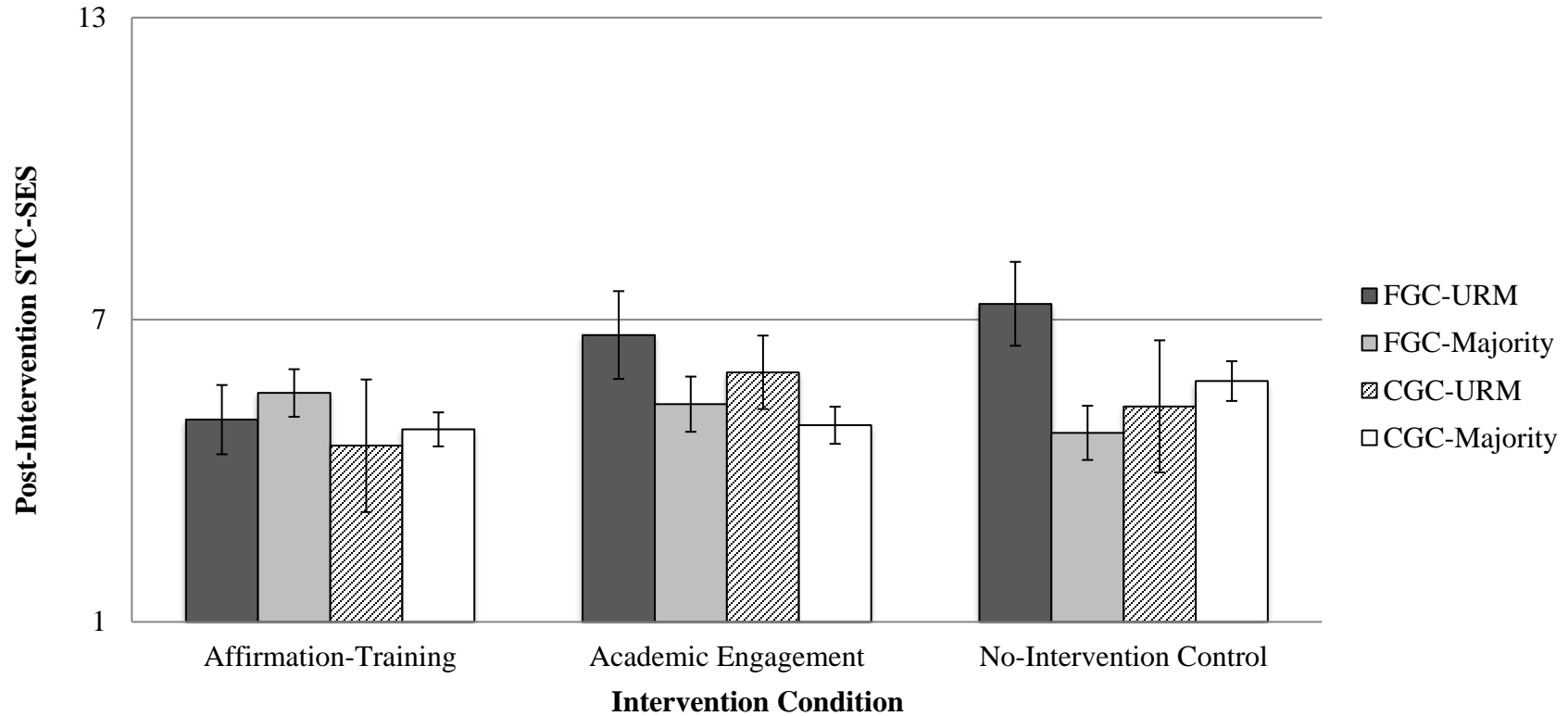


Figure 8. Study 2: Post-intervention stereotype-threat concern based on socio-economic background (adjusted for pre-intervention STC-SES) as a function of college-generational status, race/ethnicity, and intervention condition.

Error bars represent +/- 1 standard errors.

Affirmation-Training Intervention Condition: $N_{FGC-URM} = 15$, $N_{FGC-Majority} = 31$, $N_{CGC-URM} = 4$, $N_{CGC-Majority} = 61$.

Academic-Engagement Intervention Condition: $N_{FGC-URM} = 10$, $N_{FGC-Majority} = 23$, $N_{CGC-URM} = 13$, $N_{CGC-Majority} = 51$.

No-Intervention Control Condition: $N_{FGC-URM} = 10$, $N_{FGC-Majority} = 24$, $N_{CGC-URM} = 4$, $N_{CGC-Majority} = 45$.

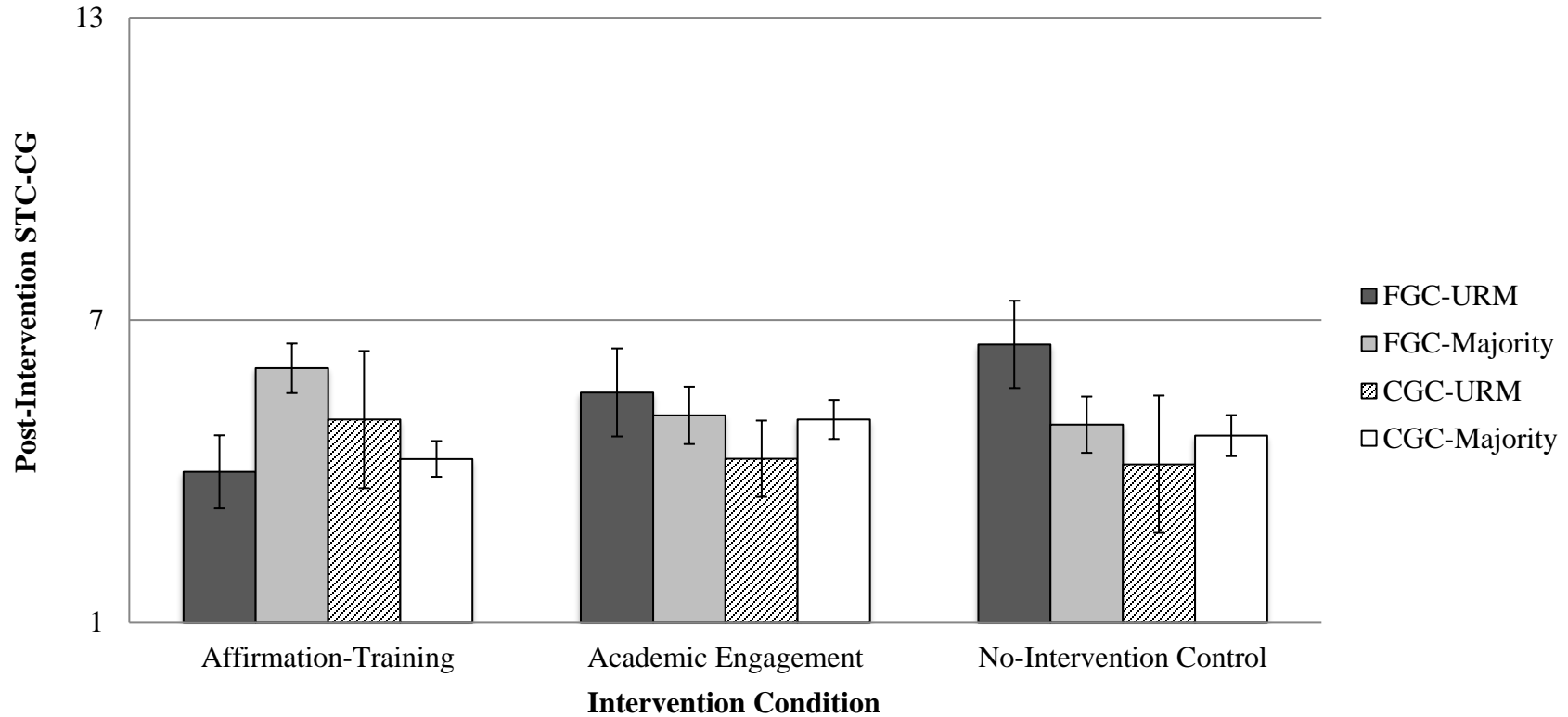


Figure 9. Study 2: Post-intervention stereotype-threat concern based on college-generational status (adjusted for pre-intervention STC-CG) as a function of college-generational status, race/ethnicity, and intervention condition.

Error bars represent +/- 1 standard errors.

Affirmation-Training Intervention Condition: $N_{FGC-URM} = 15$, $N_{FGC-Majority} = 31$, $N_{CGC-URM} = 4$, $N_{CGC-Majority} = 61$.

Academic-Engagement Intervention Condition: $N_{FGC-URM} = 10$, $N_{FGC-Majority} = 23$, $N_{CGC-URM} = 13$, $N_{CGC-Majority} = 50$.

No-Intervention Control Condition: $N_{FGC-URM} = 10$, $N_{FGC-Majority} = 24$, $N_{CGC-URM} = 4$, $N_{CGC-Majority} = 45$.

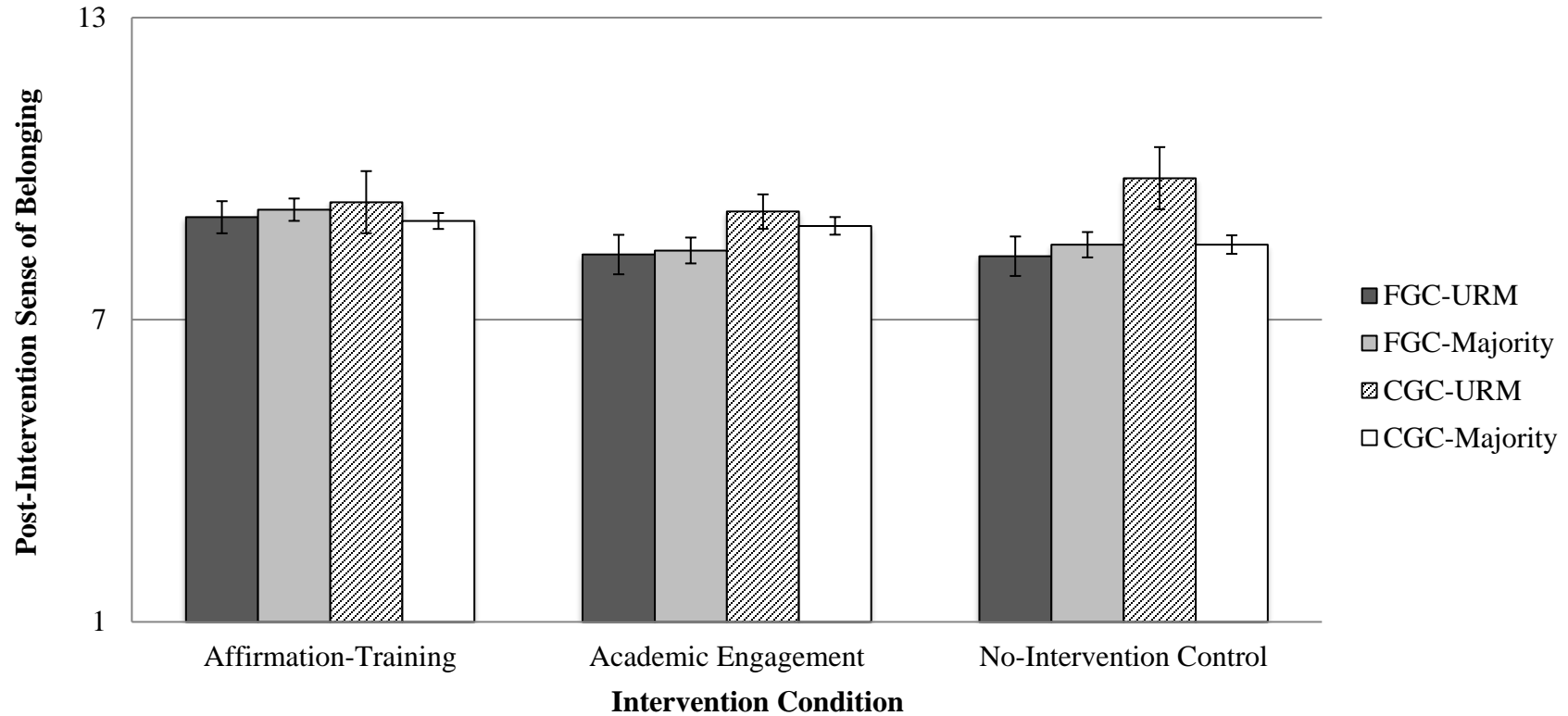


Figure 10. Study 2: Post-intervention sense of belonging (adjusted for pre-intervention sense of belonging) as a function of college-generational status, race/ethnicity, and intervention condition.

Error bars represent +/- 1 standard errors.

Affirmation-Training Intervention Condition: $N_{FGC-URM} = 15$, $N_{FGC-Majority} = 31$, $N_{CGC-URM} = 4$, $N_{CGC-Majority} = 61$.

Academic-Engagement Intervention Condition: $N_{FGC-URM} = 10$, $N_{FGC-Majority} = 23$, $N_{CGC-URM} = 13$, $N_{CGC-Majority} = 50$.

No-Intervention Control Condition: $N_{FGC-URM} = 10$, $N_{FGC-Majority} = 24$, $N_{CGC-URM} = 4$, $N_{CGC-Majority} = 45$.

APPENDIX A

STUDY 1 SURVEY

The scales below were presented in a random order within the survey. Within each scale, items were presented in a random order and the response options were provided underneath each item.

Stereotype-Threat Concern: Race/Ethnicity

Instructions: When answering the following questions, please consider your race/ethnicity.

1	2	3	4	5	6	7	8	9	10	11	12	13
I disagree completely		I disagree quite a bit		I disagree slightly		I neither agree nor disagree		I agree slightly		I agree quite a bit		I agree completely

- 1) I worry that my ability to perform well in college is affected by my race/ethnicity.
- 2) I worry that if I perform poorly in college, people will attribute my poor performance to my race/ethnicity.
- 3) I worry that people's evaluations of me will be affected by their perceptions of my race/ethnicity.

Stereotype-Threat Concern: Socio-Economic Background

Instructions: Students at UConn come from different socio-economic backgrounds. Socio-economic background is one's family's economic and social position compared to others with regard to income, education, and occupation. When answering the following questions, please consider your own socio-economic background.

1	2	3	4	5	6	7	8	9	10	11	12	13
I disagree completely		I disagree quite a bit		I disagree slightly		I neither agree nor disagree		I agree slightly		I agree quite a bit		I agree completely

- 1) I worry that my ability to perform well in college is affected by my socio-economic background.
- 2) I worry that if I perform poorly in college, people will attribute my poor performance to my socio-economic background.
- 3) I worry that people's evaluations of me will be affected by their perceptions of people with my socio-economic background.

Stereotype-Threat Concern: College-Generational Status

Instructions: Students at UConn have different college-generational statuses. Some students have parent who also attended college (i.e., continuing-generational college students); for other students, neither parent attended college (i.e., first-generation college students). When answering the following questions, please consider your own college-generational status.

1	2	3	4	5	6	7	8	9	10	11	12	13
I disagree completely		I disagree quite a bit		I disagree slightly		I neither agree nor disagree		I agree slightly		I agree quite a bit		I agree completely

- 1) I worry that my ability to perform well in college is affected by my college-generational status.
- 2) I worry that if I perform poorly in college, people will attribute my poor performance to my college-generational status.
- 3) I worry that people's evaluations of me will be affected by their perceptions of people with my college-generational status.

Sense of Belonging

Instructions: Please indicate the extent to which you agree or disagree with the following statements.
There are no right or wrong answers

1	2	3	4	5	6	7	8	9	10	11	12	13
I disagree completely		I disagree quite a bit		I disagree slightly		I neither agree nor disagree		I agree slightly		I agree quite a bit		I agree completely

- 1) I feel a sense of belonging at the University of Connecticut.
- 2) I feel as though I belong at the University of Connecticut
- 3) Knowing what I know now, I would still choose to enroll at the University of Connecticut.
- 4) So far, I have been satisfied with my academic experience at the University of Connecticut.
- 5) So far, I have been satisfied with my social experience at the University of Connecticut.
- 6) I feel as though I “fit in” at the University of Connecticut.
- 7) I believe I am a prototypical University of Connecticut student.
- 8) Sometimes I question whether I belong at the University of Connecticut. **(reversed)**
- 9) When something bad happens, I feel that maybe I don’t belong at the University of Connecticut.
(reversed)
- 10) Sometimes I feel that I belong at the University of Connecticut, and sometimes I feel that I don’t belong. **(reversed)**
- 11) When something good happens, I feel that I really belong at the University of Connecticut.
- 12) I have doubted whether I belong at the University of Connecticut. **(reversed)**

Motives for Attending College

Instructions: Please indicate the extent to which you agree or disagree with the following statements.
There are no right or wrong answers.

1	2	3	4	5	6	7	8	9	10	11	12	13
I disagree completely		I disagree quite a bit		I disagree slightly		I neither agree nor disagree		I agree slightly		I agree quite a bit		I agree completely

Interdependent Motives

- 1) I am motivated to attend college to help my family out after I’m done with college
- 2) I am motivated to attend college to be a role model in my community.
- 3) I am motivated to attend college to bring honor to my family.
- 4) I am motivated to attend college to show that people with my background can do well.
- 5) I am motivated to attend college to give back to my community.
- 6) I am motivated to attend college to provide a better life for my own children.

Independent Motives

- 7) I am motivated to attend college to expand my knowledge of the world.
- 8) I am motivated to attend college to become an independent thinker.
- 9) I am motivated to attend college to explore new interests
- 10) I am motivated to attend college to explore my potential in many domains.
- 11) I am motivated to attend college to learn more about my interests.
- 12) I am motivated to attend college to expand my understanding of the world.

APPENDIX B

STUDY 2 INSTRUCTIONS AND LABORATORY SURVEY

After giving initial consent to participate in the study, the experimenter told participants:

“Thank you for agreeing to participate in this research. The overall goal of this research is learn more about students’ experiences adjusting to being a student at UConn and to make this adjustment period better for future incoming students. The rest of the study will take place completely on the computer. Do you have any questions before you begin?”

Students in all three conditions then read the following on a desktop computer:

As the experimenter mentioned, the overall goal of this research is learn more about students’ experiences adjusting to being a student at UConn and to make this adjustment period better for future incoming students.

Today’s session has two purposes:

- 1) We’d like to understand your personal experiences and attitudes adjusting to being a student at UConn.
- 2) We’d like your help in providing incoming UConn students next year and the years to come with more accurate expectations about what it’s like being a student at UConn.

Instructions for participants in the two intervention conditions on the next page:

For today’s session, you will first complete a brief survey. Then, you will look over some results from a previous study and give us your feedback about the results.

Instructions for participants in the no-intervention control condition on the next page:

For today’s session, you will complete a brief survey.

Participants then completed the laboratory survey for Study 2 (see below).

The scales below were presented in a random order within the survey. Within each scale, items were presented in a random order and the response options were provided underneath each item.

Stereotype-Threat Concern: Race/Ethnicity

Instructions: When answering the following questions, please consider your race/ethnicity.

1	2	3	4	5	6	7	8	9	10	11	12	13
I disagree completely		I disagree quite a bit		I disagree slightly		I neither agree nor disagree		I agree slightly		I agree quite a bit		I agree completely

- 1) I worry that my ability to perform well in college is affected by my race/ethnicity.
- 2) I worry that if I perform poorly in college, people will attribute my poor performance to my race/ethnicity.
- 3) I worry that people's evaluations of me will be affected by their perceptions of my race/ethnicity.

Stereotype-Threat Concern: Socio-Economic Background

Instructions: Students at UConn come from different socio-economic backgrounds. Socio-economic background is one's family's economic and social position compared to others with regard to income, education, and occupation. When answering the following questions, please consider your own socio-economic background.

1	2	3	4	5	6	7	8	9	10	11	12	13
I disagree completely		I disagree quite a bit		I disagree slightly		I neither agree nor disagree		I agree slightly		I agree quite a bit		I agree completely

- 1) I worry that my ability to perform well in college is affected by my socio-economic background.
- 2) I worry that if I perform poorly in college, people will attribute my poor performance to my socio-economic background.
- 3) I worry that people's evaluations of me will be affected by their perceptions of people with my socio-economic background.

Stereotype-Threat Concern: College-Generational Status

Instructions: Students at UConn have different college-generational statuses. Some students have parent who also attended college (i.e., continuing-generational college students); for other students, neither parent attended college (i.e., first-generation college students). When answering the following questions, please consider your own college-generational status.

1	2	3	4	5	6	7	8	9	10	11	12	13
I disagree completely		I disagree quite a bit		I disagree slightly		I neither agree nor disagree		I agree slightly		I agree quite a bit		I agree completely

- 1) I worry that my ability to perform well in college is affected by my college-generational status.
- 2) I worry that if I perform poorly in college, people will attribute my poor performance to my college-generational status.
- 3) I worry that people's evaluations of me will be affected by their perceptions of people with my college-generational status.

Sense of Belonging

Instruction: Please indicate the extent to which you agree or disagree with the following statements.
There are no right or wrong answers

1	2	3	4	5	6	7	8	9	10	11	12	13
I disagree completely		I disagree quite a bit		I disagree slightly		I neither agree nor disagree		I agree slightly		I agree quite a bit		I agree completely

- 1) People at the University of Connecticut accept me.
- 2) I feel like an outsider at the University of Connecticut. **(reversed)**
- 3) Other people understand more than I do about what is going on at the University of Connecticut.
(reversed)
- 4) I think in the same way as do people who do well at the University of Connecticut.
- 5) It is a mystery to me how things work at the University of Connecticut. **(reversed)**
- 6) I feel alienated from the University of Connecticut. **(reversed)**
- 7) I fit in well at the University of Connecticut.
- 8) I am similar to the types of people that succeed at the University of Connecticut.
- 9) I know what kind of people that the professors at the University of Connecticut are.
- 10) I get along well with the people at the University of Connecticut.
- 11) I belong at the University of Connecticut.
- 12) I know how to do well at the University of Connecticut.
- 13) I do not know what to do to make the professors at the University of Connecticut to like me.
(reversed)
- 14) I feel comfortable at the University of Connecticut.
- 15) People at the University of Connecticut like me.
- 16) If I wanted to, I could potentially do very well at the University of Connecticut.
- 17) People at the University of Connecticut are a lot like me.
- 18) Sometimes I question whether I belong at the University of Connecticut. **(reversed)**
- 19) When something bad happens, I feel that maybe I don't belong at the University of Connecticut.
(reversed)
- 20) Sometimes I feel that I belong at the University of Connecticut, and sometimes I feel that I don't belong. **(reversed)**
- 21) When something good happens, I feel that I really belong at the University of Connecticut.
- 22) I have doubted whether I belong at the University of Connecticut. **(reversed)**

APPENDIX C

STUDY 2 INTERVENTION PROCEDURES AND STIMULI

After completing the brief survey (see above), participants in the control condition were thanked for the participation and excused from the study session.

Participants in the two intervention conditions read the following instructions on a separate page:

During the last year, our lab has been conducting a survey of upper-year—junior and senior—students’ experiences adjusting to being a student at UConn. So far we have found some intriguing results. Interestingly, the results from this survey tend to be consistent for a variety of different students, including students from different majors, genders, ethnicities, and social-class backgrounds. Today, we’d appreciate your help interpreting the results of this survey, and to provide future UConn with some advice on adjusting to life at UConn. The next couple pages will show you some of the results of the survey and some quotations from the upper-year students’ experiences.

Participants in the two intervention conditions were then exposed to one of two interventions—an affirmation-training intervention or an academic engagement intervention (see below).

After being exposed to the intervention, participants in the affirmation-training intervention condition then read the following instructions:

We would now like for you to write a brief essay about why you think people’s experiences at UConn develop in the way that the junior and senior students described—**how students were able to remind themselves about aspects of lives that they value outside of school, as a way to manage the workload and stress of being in college.** When writing your essay, please try to include examples from your own experience. Feel free to look back over the survey results while writing your essay (see survey results below). We hope to share selections of what students write in this study with first-year students next year. We hope it will help them with their transition to UConn. We believe that the students who read about your experiences will appreciate the effort you put in. You will be given 20 minutes to write your essay.

After being exposed to the intervention, participants in the academic-engagement intervention condition then read the following instructions:

We would now like for you to write a brief essay about why you think people’s experiences at UConn develop in the way that the junior and senior students described—**how students were able to become more engaged with their coursework, both inside and outside of the classroom, as a way to manage the workload and stress of being in college.** When writing your essay, please try to include examples from your own experience. Feel free to look back over the survey results while writing your essay (see survey results below). We hope to share selections of what students write in this study with first-year students next year. We hope it will help them with their transition to UConn. We believe that the students who read about your experiences will appreciate the effort you put in. You will be given 20 minutes to write your essay.

Participants were given 20 minutes to write their essays.

After completing their essays, participants in the affirmation-training condition read the following instructions:

Now, using the paper and envelope on the desk, we would like for you to rewrite your essay as a personal letter a future student. We have learned that students really appreciate hearing directly from older students who already have some experience making the transition to UConn. To give next year's students a chance to hear directly from an older student, we would like you to write a letter to an incoming UConn student next year about your transition, and what you've learned—**including how students may learn ways to manage stress by thinking about things they value outside school.**

We will give these letters to a student of the same major, so you can imagine it is a student like you. We know that it can be difficult to write a personal letter to a stranger, but we believe it will be particularly meaningful for incoming students if they feel as though an older student is speaking directly to them about their experiences.

When you are done writing your letter, please put in the envelope and crack open your door to let the experimenter know you're done.

After completing their essays, participants in the academic-engagement condition read the following instructions:

Now, using the paper and envelope on the desk, we would like for you to rewrite your essay as a personal letter a future student. We have learned that students really appreciate hearing directly from older students who already have some experience making the transition to UConn. To give next year's students a chance to hear directly from an older student, we would like you to write a letter to an incoming UConn student next year about your transition, and what you've learned—**including how students may learn ways to manage stress by finding ways to be more engaged with their schoolwork.**

We will give these letters to a student of the same major, so you can imagine it is a student like you. We know that it can be difficult to write a personal letter to a stranger, but we believe it will be particularly meaningful for incoming students if they feel as though an older student is speaking directly to them about their experiences.

When you are done writing your letter, please put in the envelope and crack open your door to let the experimenter know you're done.

“Finding #1” for both intervention conditions



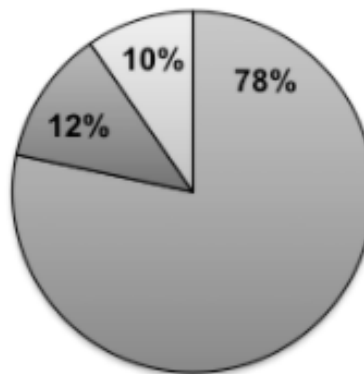
**UConn JUNIOR AND SENIOR COLLEGE EXPERIENCES:
SUMMARY OF RESULTS: Page 1**

The major findings reported below are consistent for students from different majors, genders, ethnicities, and social-class backgrounds.

Finding #1: The vast majority of juniors and seniors reported that they initially felt overwhelmed managing the workload when they first got to UConn, either as a freshman or transfer student.

Managing Workload as a New UConn Student

- ☐ Overwhelmed by the workload
- ☐ Had easy time managing workload
- ☐ Workload was neither easy nor difficult



“Finding #2” for both intervention conditions

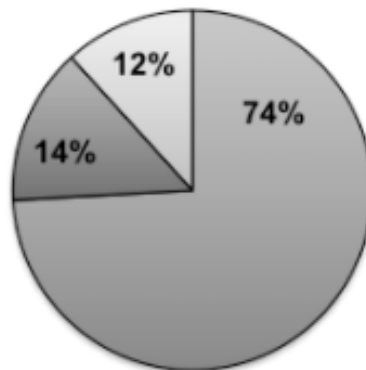


**UConn JUNIOR AND SENIOR COLLEGE EXPERIENCES:
SUMMARY OF RESULTS: Page 2**

Finding #2: Although adjusting to life at UConn was difficult at first, the majority of juniors and seniors reported that they began to adjust to life at UConn, and that their college experiences became better over time.

Adjusting to Life as a Student at UConn

- ☐ Over time, my experience at Uconn became better and more fulfilling
- ☐ Over time, my experience at Uconn remained difficult
- ☐ Over time, my experience at Uconn became worse and worse



“Finding #3” for the Affirmation-Training Intervention condition



**UConn JUNIOR AND SENIOR COLLEGE EXPERIENCES:
SUMMARY OF RESULTS: Page 3**

Finding #3: Many of these students were able to adjust to life at UConn by finding ways to manage their stress and find balance, by doing things like spending time with friends, putting their workload in perspective, going to the gym, and taking mental “time outs”.

Below are some illustrative quotes concerning this third major finding.

When I first got to UConn, I worried that I was different from the other students. Everyone else seemed so excited and happy to be here but I just felt stressed and overwhelmed. There were so many new people, my classes were harder; it was a totally new environment. Sometime after my first year, I realized that almost everyone feels overwhelmed at times in the transition to college. It’s just a process that everyone goes through. It takes time to find your own way of keeping things in balance in a new place. Now it seems ironic – everyone feels different first year, when really we’re all experiencing the same things.

- Karen, Junior, Sociology major

I was excited to come to UConn, and I really enjoyed the first few weeks of classes. I thought I understood the material. But then midterms came, and I bombed an exam. It was the worst grade I’d ever received. For a few days, I was totally stressed, and it was all I could think about. But then I went out with my friends one night and we had a blast. I didn’t think about school at all. The next day I found I could focus much better – and actually understood what I was studying. I learned that when I’m stressed, sometimes I need to take a night off. Learning that about myself helped me handle challenges at UConn, and helped me have a terrific experience even though it was hard at first.

- Alex, Senior, English major

Looking back on my first year, I see now that it was really stressful. I didn’t recognize it all the time – sometimes you can’t see stress, I think – but there was a lot to handle all at once, with work, and trying to make friends. My first work term was particularly tough. There were a lot of deadlines. At first I couldn’t get my mind off work, even in the evenings or on the weekends. But then I started to do a lot more things I really enjoy. I really got into this band, and I listened to them a lot. I saw them in concert a few times too. Other things I’d do is go to the gym for a work out, or take a walk through the park. Those things took my mind off work. I know myself a little better now, and I see it’s important for me to keep a sense of balance, especially when I’m going through a new experience. That insight helped me manage stress and challenges. I’ve had a wonderful time at UConn, and a big part of that was learning this lesson.

- Mark, Senior, Psychology major

When I first got to UConn, I worried a lot about what grades I was getting. So it was stressful. Sometimes I would get a good grade, and sometimes I would get a bad grade. Eventually, it just felt crazy. I decided that, instead of worrying about grades, I should pursue my interests and let things fall into place. I picked engineering because I’m really interested in it. And it’s really cool to be at UConn – it’s such a good school, and the professors and students are excited about discovering new things, and learning how things work. I realized that, for me, when I feel overwhelmed in class, it’s good to take a moment and think about what’s interesting in the material – why I’m excited to learn it. And of course, that happens out of class too – even when I just get together with my friends and watch dorky TV shows like *Monster Machines*, or even for things

unrelated to engineering. It was a hard transition at first, but it helped me to keep in mind how I enjoy learning for the sake of learning. Since then, I've had a great experience at UConn.

- Fatima, Junior, Engineering major

My first year was tough. I didn't know many people, and my classes were a ton of work. There was one particular stretch – I had a bunch of midterms and some nasty assignments, all at the same time. I was stressed. One night, I remember, I was trying to finish up an assignment and I had to study for a test later. It was going to be a long night. But I took a break and called home. I talked to my mom. It was just a 5-minute phone call, but when we hung up and I went back to studying I felt so much better. I understand now the value of taking a time-out. Sometimes when I'm about to take a test, I take a mental break – and think about getting together with friends later or talking to my parents. There is so much going on, sometimes you have to take time to relax.

- Arielle, Senior, Allied Health major

In first year I sometimes felt like I had tunnel vision – that I was just so completely caught up with life at UConn – with classes, with people I was meeting, the whole thing really – and I hardly thought of anything else and, it was hard at first and it was stressful. But then I realized that, well there are things outside of school that I do care about. I remembered that I had done volunteering in high school, and so I decided to get involved with an environmental group here on campus. And even though, objectively, I had less time with, volunteering on top of schoolwork, I found I felt really refreshed and I could concentrate a lot better. I also met a lot of people while I was volunteering, and most of them shared similar interests as me, and we all became really good friends. I find that the longer I spend in UConn, the more I find things to do that are just broadening my life away from schoolwork and it's really good. It took me time to find those activities, but they've made a really big difference in my experience. And, I guess the one thing I had to learn was that it isn't the best thing for me to just study non-stop.

- Mahesh, Junior, Psychology major

During my first semester at UConn I couldn't believe how much work there was. Sometimes it seemed that all I did was study, read, and prepare for tests. Sometimes I started to wonder why I was in college at all. Then I had this conversation with the RA in my dorm. He was still finishing his last semester at UConn, and he already had two offers for really high-paying jobs. I realized that all my hard work would pay off in the end. Now sometimes when I'm stressed I plan out the dream vacation that I am going to take when I get my first pay cheque.

- Beth, Junior, Business major

At first my transition to UConn was pretty easy. Going out was fun, I got to know a bunch of people early on in my dorm. I didn't even realize I was stressed out until I saw one day that my nails were bitten down. Also, my jaw hurt, and my roommate said he thought I was grinding my teeth at night. Even though I was having a lot of fun, everything was so new – my classes, the people, how I spent my time – that was stressful too. I realized that I needed to take more time to reflect on things, and for me, that meant relating things to my faith. So I took more time each day to think about these things and pray. It helped me think about what was really important, and put what I was experiencing each day in perspective.

- Tom, Senior, Allied Health major

When I'm really concentrating on school, or when I'm stressed out about to take a test, it's hard to remember about other things that are important to me. Whatever I'm stressed about balloons up in my mind out of proportion, and I don't think about other things that are important. But I've learned that for me it's really helpful at times, to take a moment and put things in perspective – to think about my friends and family, or values that are important to me. It helps me realize that whatever I'm stressed about is trivial in the grand scheme of things. That didn't come naturally for me. It was a process to learn when and how to do it. But I'm thankful I did. It helped me manage things better in university.

- Lisa, Senior, Psychology major

“Finding #3” for the Academic-Engagement Intervention condition



**UCONN JUNIOR AND SENIOR COLLEGE EXPERIENCES:
SUMMARY OF RESULTS: Page 3**

Finding #3: Many of these students were able to adjust to life at UConn by finding ways to become more engaged with their coursework, particularly by finding different strategies to help them complete all of their schoolwork and really understand the material.

Below are some illustrative quotes concerning this third major finding.

When I first got to UConn, I worried that I was different from the other students. Everyone else seemed so excited and happy to be here but I just felt stressed and overwhelmed. There were so many new people, my classes were harder; it was a totally new environment. Sometime after my first year, I realized that had to do some extra work outside class. One thing I did was complete all the practice problems a week or two before the exam. That way if I still had questions about the material I could go to the TA or professor. When I did that for a set of exams, it worked. My grades started to improve, and I realized that I started understanding the material better too. It was hard to get my act together a week or two ahead of time, but it really paid off.

- Karen, Junior, Sociology major

I was excited to come to UConn, and I really enjoyed the first few weeks of classes. I thought I understood the material. But then midterms came, and I bombed an exam. It was the worst grade I'd ever received. For a few days, I was totally stressed, and it was all I could think about.

Eventually, I realized I didn't know how to study properly. Based on some advice from a friend, I started reviewing my lecture notes at the end of each class. Doing this really helped me learn and connect with the class material – it also made it easy tell if there was something I missed, or something you didn't understand during class. And then I could ask about it during the next class. It was difficult to make a habit of reviewing lecture notes after each class, but once I did, it made it a lot easier to comprehend the class material.

- Alex, Senior, English major

Looking back on my first year, I see now that it was really stressful. I didn't recognize it all the time – sometimes you can't see stress, I think – but there was a lot to handle all at once, with work, and trying to make friends. My first work term was particularly tough. There were a lot of deadlines. At first I couldn't get my mind off work, even in the evenings or on the weekends. I eventually learned that when there's a lot on my mind it helps to make a list. Sometimes there's just too much to keep track of in my head. I found that writing down all of due dates for my assignments, and the dates for my exams, in a planner really helped. It allowed me to organize the time I spent working on assignments and studying for tests. After doing this, I rarely lost points for turning assignments late, I always felt prepared when I sat down for a test.

- Mark, Senior, Psychology major

When I first got to UConn, I worried a lot about what grades I was getting. So it was stressful. Sometimes I would get a good grade, and sometimes I would get a bad grade – it just felt crazy. At some point, I learned that, in college, there is just too much work to do and not enough time. And that if I wanted to do well, I had to prioritize. I learned that it's important to pay attention to the professors, and where they concentrate their lectures. Usually the weight of each topic depends on the amount of teaching time spent on it. And of course, even if you're exhausted, it's important to show up for lectures. Even if I am still half asleep during the lecture,

I can pick up a thing or two and take a few notes. I found that the more I attended class and paid attention, the more comfortable I felt asking questions when something in the lecture wasn't clear.

- Fatima, Junior, Engineering major

My first year was tough. I didn't know many people, and my classes were a ton of work. There was one particular stretch – I had a bunch of midterms and some nasty assignments, all at the same time. I was stressed. Toward the end of my first semester, I learned that it helps to always look ahead to see what's coming next in class. I learned that sometimes I had to do more work this week so that I have enough time get everything done next week. I found that if looked ahead, I was able to only worry about the task at hand. When I had an idea about what was coming next, everything suddenly becomes a lot easier.

- Arielle, Senior, Allied Health major

In first year I sometimes felt like I had tunnel vision – that I was just so completely caught up with life at UConn – with classes, with people I was meeting, the whole thing really – and I hardly thought of anything else and, it was hard at first and it was stressful. Eventually, during the second semester of my first year, I realized that, if I wanted to get everything done, I needed to become a more efficient studier. Learning doesn't happen simply by stuffing material into your brain; what you learn needs to be integrated with what you already know. I found that taking a 10-minute break for every 50 minutes of studying helped me to hold information. After my relaxing break, it also helped to change the subject or task that I was studying to a new one. This way, my brain didn't get tired of absorbing the same material hour after hour.

- Mahesh, Junior, Psychology major

During my first semester at UConn I couldn't believe how much work there was. Sometimes it seemed that all I did was study, read, and prepare for tests. Sometimes I started to wonder why I was in college at all. At some point during my first year, I learned that, in college, it's not only important how you study, but where you study. Even little things such as if the room was too warm or too cool, or if there was a lack of circulating air made me sleepy and unable to concentrate. I also found that studying in my dorm room with my friends around was too distracting. Sometimes just putting on headphones and listening to music helped me ignore these distractions. Other times, if I really needed to concentrate, I would head over to the library. Once I learned how to study more efficiently, I found it easier to do well in my classes.

- Beth, Junior, Business major

At first my transition to UConn was pretty easy. Going out was fun, I got to know a bunch of people early on in my dorm. I didn't even realize I was stressed out until I saw one day that my nails were bitten down. Also, my jaw hurt, and my roommate said he thought I was grinding my teeth at night. Even though I was having a lot of fun, everything was so new – my classes, the people, how I spent my time – that was stressful too. Things got a lot better once I learned how to get the most out of each lecture. I realized that I needed to become basically a better listener and a better note-taker. I eventually became a more positive and active listener basically just by sitting at the front of the class and sitting quietly. I found it particularly important to try to make extra effort to pay attention during the second half of the lecture just because that's when I tended to drift away and lose it, and especially also during the last few minutes when a summary or conclusions was given by the professor. When it comes to taking good notes in lectures, I try and make sure that I'm being accurate and focusing on the main ideas. I like to leave space between the main ideas just so that I could go back later and add notes in my own words – doing this really helped make the lecture sink in.

- Tom, Senior, Allied Health major

During my first few weeks at UConn, I spent more time worrying about doing well in my classes than actually studying for them. This caused me to do poorly on my midterm exams. I eventually realized that I wasn't trying hard enough in my classes. I was showing up to class, but I wasn't doing the assigned readings, I would never raise my hand in class, and I would never go to the TA's office hours. After I did so poorly on my midterms, I decided to change things up. I started raising my hand in class when I had a question, I started doing the assigned readings, and I started going to office hours every week just to make sure I was on the right track. Doing all of this caused me to stop worrying, and I eventually started getting better grades.

- Lisa, Senior, Psychology major

APPENDIX D

STUDY 2 ONLINE FOLLOW-UP SURVEY AND INTERVENTION BOOSTERS

The scales below were presented in a random order within the survey. Within each scale, items were presented in a random order and the response options were provided underneath each item. For participants in the two intervention conditions, the intervention boosters always appeared last.

Stereotype-Threat Concern: Race/Ethnicity

Instructions: When answering the following questions, please consider your race/ethnicity.

1	2	3	4	5	6	7	8	9	10	11	12	13
I disagree completely		I disagree quite a bit		I disagree slightly		I neither agree nor disagree		I agree slightly		I agree quite a bit		I agree completely

- 1) I worry that my ability to perform well in college is affected by my race/ethnicity.
- 2) I worry that if I perform poorly in college, people will attribute my poor performance to my race/ethnicity.
- 3) I worry that people's evaluations of me will be affected by their perceptions of my race/ethnicity.

Stereotype-Threat Concern: Socio-Economic Background

Instructions: Students at UConn come from different socio-economic backgrounds. Socio-economic background is one's family's economic and social position compared to others with regard to income, education, and occupation. When answering the following questions, please consider your own socio-economic background.

1	2	3	4	5	6	7	8	9	10	11	12	13
I disagree completely		I disagree quite a bit		I disagree slightly		I neither agree nor disagree		I agree slightly		I agree quite a bit		I agree completely

- 1) I worry that my ability to perform well in college is affected by my socio-economic background.
- 2) I worry that if I perform poorly in college, people will attribute my poor performance to my socio-economic background.
- 3) I worry that people's evaluations of me will be affected by their perceptions of people with my socio-economic background.

Stereotype-Threat Concern: College-Generational Status

Instructions: Students at UConn have different college-generational statuses. Some students have parent who also attended college (i.e., continuing-generational college students); for other students, neither parent attended college (i.e., first-generation college students). When answering the following questions, please consider your own college-generational status.

1	2	3	4	5	6	7	8	9	10	11	12	13
I disagree completely		I disagree quite a bit		I disagree slightly		I neither agree nor disagree		I agree slightly		I agree quite a bit		I agree completely

- 1) I worry that my ability to perform well in college is affected by my college-generational status.
- 2) I worry that if I perform poorly in college, people will attribute my poor performance to my college-generational status.
- 3) I worry that people's evaluations of me will be affected by their perceptions of people with my college-generational status.

Sense of Belonging

Instruction: Please indicate the extent to which you agree or disagree with the following statements.
There are no right or wrong answers

1	2	3	4	5	6	7	8	9	10	11	12	13
I disagree completely		I disagree quite a bit		I disagree slightly		I neither agree nor disagree		I agree slightly		I agree quite a bit		I agree completely

- 1) People at the University of Connecticut accept me.
- 2) I feel like an outsider at the University of Connecticut. **(reversed)**
- 3) Other people understand more than I do about what is going on at the University of Connecticut.
(reversed)
- 4) I think in the same way as do people who do well at the University of Connecticut.
- 5) It is a mystery to me how things work at the University of Connecticut. **(reversed)**
- 6) I feel alienated from the University of Connecticut. **(reversed)**
- 7) I fit in well at the University of Connecticut.
- 8) I am similar to the types of people that succeed at the University of Connecticut.
- 9) I know what kind of people that the professors at the University of Connecticut are.
- 10) I get along well with the people at the University of Connecticut.
- 11) I belong at the University of Connecticut.
- 12) I know how to do well at the University of Connecticut.
- 13) I do not know what to do to make the professors at the University of Connecticut to like me.
(reversed)
- 14) I feel comfortable at the University of Connecticut.
- 15) People at the University of Connecticut like me.
- 16) If I wanted to, I could potentially do very well at the University of Connecticut.
- 17) People at the University of Connecticut are a lot like me.
- 18) Sometimes I question whether I belong at the University of Connecticut. **(reversed)**
- 19) When something bad happens, I feel that maybe I don't belong at the University of Connecticut.
(reversed)
- 20) Sometimes I feel that I belong at the University of Connecticut, and sometimes I feel that I don't belong. **(reversed)**
- 21) When something good happens, I feel that I really belong at the University of Connecticut.
- 22) I have doubted whether I belong at the University of Connecticut. **(reversed)**

Intervention Boosters

Participants in the no-intervention control condition did not receive “booster” writing exercise—they just completed the online follow-up survey. Within each intervention condition, the list of values was presented in a random order and the selected value was automatically inserted into the instructions for the writing exercise.

Affirmation-Training Intervention Booster

Instructions: From the list provided please select the characteristic that you find most valuable and important.

Athletic ability
 Being good at art
 Creativity
 Independence
 Living in the moment
 Membership in a social group (such as your community, racial group, or school club)
 Music
 Relationships with family and friends
 Religious values
 Sense of humor

Instructions: Now, please write a brief paragraph about why [*insert selected value from previous question here*] is valuable and important to you.

Academic-Engagement Intervention Booster

Instructions: From the list provided please select the academic behavior that you find most valuable and important.

Arriving to class on time
 Listening intently during class
 Taking thorough notes during class
 Being engaged during class discussions
 Asking questions in class when something isn't clear
 Doing the required reading
 Turning assignments in on time
 Studying for exams
 Forming a study group
 Attending office hours

Instructions: Now, please write a brief paragraph about why [*insert selected behavior from previous question here*] is valuable and important to you.